UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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APR 16 2018

Ref: 8EPR-SR

Mr. Thomas A. Turner
Director, Base Operations
JMTE-GMV-EM, Building 501
1 Tooele Army Depot
Tooele, Utah 84074-5003

Re: Five-Year Review Report for Tooele Army Depot (TEAD), Tooele County, Utah

Dear Mr. Turner:

Thank you for submitting the Five Year Review (5YR) Report for Tooele Army Depot, a U.S. DOD Site in Tooele County, Utah. It is the U.S. Environmental Protection Agency's (EPA's) policy to make protectiveness determinations at federal facilities based on whatever 5YR report is available on the statutory due date. The Tooele 5YR due date was March 28, 2018. This letter is based on the draft 5YR submitted February 8, 2018. It is still the Army's responsibility to respond to regulator comments and complete the 5YR in a timely fashion. It is our understanding that the 5YR report will be resubmitted for staff review within the month.

The EPA, in consultation with the State of Utah, concurs with the majority of your assessments of the Superfund remedies. TEAD includes 9 operable units being managed under CERCLA. Operable Units (OUs) 4, 8 and 9 are protective in the short term. OU7 is protective. OUs 10, 15, and 16 did not require evaluation. The EPA concurs with these determinations.

The EPA disagrees with the Army's draft report indicating that OUs 5 and 6 are deferred to other programs. The EPA indicated after the last 5YR that deferrals of OU5 and OU6 to the Nuclear Regulatory Commission and Toxic Substances Control Act are not appropriate, and that a review should take place between 5YRs to determine whether a new decision document will be needed. OU5 was evaluated outside the 5YR, and found to be suitable for unrestricted use and unlimited exposure (UU/UE). A similar evaluation has not taken place for OU6 (SWMU 18). The EPA has changed protectiveness to "deferred" for OU 6, pending evaluation. It is our understanding after talking with staff, that the Army is not in disagreement with this change.

A summary is enclosed of OU-specific protectiveness statements and the associated issues and recommendations which will be tracked at the EPA. This information will be included in the EPA's annual Superfund Five-Year Review Report to Congress. A sitewide protectiveness statement is not expected until all Records of Decision are in place and remedial actions are through the construction completion phase.

The environmental indicators for this site are "current human exposure under control" and "insufficient data to determine migration control status" for ground water contamination. Ground water is currently

managed under a state hazardous waste management permit. A number of source control measures were implemented about 5 years ago. Continued sampling and modeling, and the Monitored Natural Attenuation study in progress are expected to identify if further actions are needed to move the ground water environmental indicator toward "contaminated ground water migration under control."

The due date for the next five-year review report will be March 28, 2023. If you have any questions please do not hesitate to call me at (303) 312- 6231 or my staff Patricia Smith, at smith.patricia@epa.gov or (303) 312-6504.

Sincerely,

Betsy Smidinger
Assistant Regional Administrator
Office of Ecosystems Protection
and Remediation

Enclosures:
1. Protectiveness Statements
2. Issues and Recommendations

cc: Ms. Katie Crane
Utah Department of Environmental Quality

TEAD 2018 5YR Protectiveness statements

OU	Protectiveness Determination	Protectiveness Statement
4	Short term protective	The remedy for OU 4 currently protects human health and the environment because exposure pathways that could result in unacceptable risks are being addressed through institutional controls. However, in order to be protective in the long term the warning sign at SWMU 31 should be replaced.
6	Deferred	A protectiveness determination of the remedy at OU6 cannot be made at this time until further information is obtained. Further information will be obtained to determine whether SWMU 18 qualifies for UU/UE. It is expected this action will take less than one year to complete, at which time a protectiveness determination will be made.
7	Protective	The remedy for OU 7 is protective of human health and the environment. Exposure pathways that could result in unacceptable risks are being controlled with soil/gravel cover and institutional controls.
8	Short term protective	The remedy for OU 8 currently protects human health and the environment because exposure pathways to soils by depot and construction workers at SWMU 8 have been eliminated by the removal and treatment of the lead contaminated soil. The treated soil was placed in a CAMU. All remaining exposure pathways that could result in unacceptable risks at OU 8 SWMUs are being controlled through institutional controls. However, in order for the remedy to be protective in the long term the warning signs at SWMU 6 should be replaced and the fence should be repaired.
9	Short term protective	The remedy for OU 9 currently protects human health and the environment because exposure pathways to soils by depot and construction workers at SWMU 23 have been eliminated by removal and disposal of the PCB and cPAH contaminated soil. All remaining exposure pathways that could result in unacceptable risks at OU 9 SWMUs are being controlled through institutional controls. However, in order to be protective in the long-term vegetation should be removed from in front of the gate to allow for it to be locked at SWMU 40 and the direction of the warning sign at SWMU 7 should be changed to allow visibility to personnel approaching the SWMU.

Deviations from the Army Feb 2018 draft 5YR in red.

Protectiveness statements not required	
	Reason
5	UU/UE
10	UU/UE
15	ROD not in place
16	UU/UE

TEAD 2018 5YR issues and recommendations

OU	Issue Type	Issue	Recommendation	Affects Protectiveness?		Milestone Date
4, 8	IC	No warning sign was observed at SWMU 31. Warning signs at SWMU 6 were extremely faded and unreadable.	Determine if RDIC needs amendment or if a compliance issue exists.	N	Y	5/15/18
			Replace warning signs at SWMUs 31 and 6			6/28/18
6	other	NRC deferral does not apply and a CERCLA risk determination is required.	Evaluate whether UU/UE applies.	N	Y	9/14/18
			Sample if needed			9/15/19
8	IC	Fence surrounding SWMU 6 is damaged at the entrance which does not allow for the gate to be locked.	Determine if RDIC needs amendment or if a compliance issue exists.	N	Y	5/15/18
			Repair damaged fencing			6/28/18
9	IC	The text of the warning sign is not visible to personnel approaching SWMU 7.	Determine if RDIC needs amendment or if a compliance issue exists.	N	Y	5/15/18
			Change the direction of warning sign at SWMU 7 to allow visibility to personnel.			6/28/18
9	IC	The front gate of SWMU 40 was found open and unlocked. The gate could not be closed and locked due to overgrown vegetation in front of the gate.	Determine if RDIC needs amendment or if a compliance issue exists.	N	Y	5/15/18
			Clear vegetation in front of gate to allow for closure.			6/28/18
8, 9	IC	SWMU 13 and 35 warning signs were not visible when approached as they were not attached to the post.	Determine if RDIC needs amendment or if a compliance issue exists.	N	Y	5/15/18
			Attach warning signs to the post.			6/28/18

Deviations from the Army Feb 2018 draft 5YR in red.

FOURTH FIVE-YEAR REVIEW REPORT FOR
Tooele Army Depot SUPERFUND SITE
Tooele County, Utah

Prepared for:

Tooele Army Depot
Tooele, UT

Prepared by:

U.S Army Corps of Engineers
Savannah District
CESAS-EN-GH
100 W. Oglethorpe Avenue
Savannah, GA 31401

Approved By:

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Nicholas Montgomery **Date**
Tooele Army Depot
Chief, Engineering and Environmental

Approved By:

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Date

ACSIM BRAC Division
Branch Chief

Reviewed By:

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Date

Tooele Army Depot
Restoration Program Manager

Review Team Technical Lead:

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Sararina Huff **Date**
U.S. Army Corps of Engineers
Chemist

Five-Year Review Report

Table of Contents

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List of Acronyms

2,4-DNT	2,4-dinitrotoluene
AED	Ammunition Equipment Directorate
BRAC	Base Realignment and Closure
CCR	Covenants, Conditions, And Restrictions
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cm/sec	Centimeters per Second
CAMU	Corrective Action Management Unit
COC	Contaminant of Concern
COPC	Contaminant of Potential Concern
cPAH	Carcinogenic Polycyclic Aromatic Hydrocarbons
DBHC	Delta-benzenehexachloride
DERR	Division of Environmental Response and Remediation
DOD	Department of Defense
DRMO	Defense Reutilization and Marketing Office
EPA	United States Environmental Protection Agency
EPC	Exposure Point Concentration
ESD	Explanation of Significant Differences
FFA	Federal Facilities Agreement
FOSET	Finding of Suitability for Early Transfer
FRG	Final Remedial Goal
FS	Feasibility Study
ft/day	Feet per Day
ft/yr	Feet per Year
FYR	Five Year Review
IC	Institutional Control
in/yr	Inch per Year
IUR	Inhalation Unit Risk
IWL	Industrial Waste Lagoon
LUC	Land Use Control
MC	Munitions Constituents
MDL	Method Detection Limit
MEC	Munitions and Explosives of Concern
MMRP	Military Munition Response Program
MRS	Munition Response Site
msl	Mean Sea Level
NFA	No Further Remedial Action
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
ORAP	Army Operational Range Assessment Program
O&M	Operations and Maintenance
OU	Operable Unit
PAHs	Polycyclic Aromatic Hydrocarbons

PCB	Polychlorinated Biphenyls
PCE	Tetrachloroethylene/Perchloroethylene
RACR	Remedial Action Closure Report
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RDIC	Remedial Design Plan for Institutional Controls
RDX	Cyclotrimethylenetrinitramine
RfC	Reference Concentration
RfD	Reference Dose
RI	Remedial Investigation
RL	Reporting Limit
RME	Reasonable maximum exposure
ROD	Record of Decision
RSL	Regional Screening Level
SARA	Superfund Amendments and Reauthorization Act
SF	Slope Factor
SPLP	Synthetic Precipitation Leachate Procedure
S/S	Solidification/Stabilization
SWMU	Solid Waste Management Unit
TBC	To be considered
TCE	Trichloroethylene
TEAD	Tooele Army Depot
TEF	Toxicity Equivalence Factor
TNT	Trinitrotoluene
TSCA	Toxic Substance Control Act
TSDF	Treatment, Storage and Disposal Facility
UAC	Utah Administrative Code
UCL	Upper Confidence Code
USACE	U.S. Army Corps of Engineers
UU/UE	Unlimited Use and Unlimited Exposure
VOC	Volatile Organic Exposure

Executive Summary

The purpose of the Fourth CERCLA Five-Year Review of the Tooele Army Depot (TEAD) National Priorities List (NPL) Site located in Tooele, Tooele County, Utah is to determine whether the remedies selected at TEAD are protective of human health and the environment for the review period. This review covers the period from March 2013 to March 2018. The triggering action for this review is the completion of the third five-year review in March 2013.

All sites on TEAD were designated a sequential "SWMU number" or a "TEAD number" for the munition response sites (MRSs), and are managed under CERCLA or the Resource Conservation and Recovery Act (RCRA). OUs 4-10 & 15-16 are being addressed under CERCLA. OUs 1-3 & 11-14 are being addressed under Utah Resource Conservation and Recovery Act (RCRA) authority. This five-year review only includes the OUs being addressed under CERCLA.

The following sites have achieved a condition of UU/UE and are not assessed in this review:

- OU 4 SWMU 32
- OU 5 SWMU 17
- OU 6 SWMU 9
- OU 10 SWMU 41
- OU 16 TEAD-003-R-001

Two sites (OU 6 SWMU 18 and OU 5 SWMU 33) have been deferred to administration under other federal authorities.

The remaining 11 SWMUs have been closed with institutional control (IC) requirements. Remedies have been completed at all 11 sites. The remedies include:

- Institutional controls at all 11 sites prohibiting residential use and off-site transporting of soils
- OU 7 SWMU 5 -Backfilling of an existing excavation and capping the area with soil and gravel
- OU 8 SWMU 6 -Excavation and offsite disposal of lead and explosive contaminated soil
- OU 8 SWMU 8 -Excavation, stabilization and disposal of lead contaminated soil in a Corrective Action Management Unit (CAMU); and
- OU 9 SWMU 23 -Excavation and offsite disposal of PAH and PCB contaminated soil

The remedy for OU 4 currently protects human health and the environment because exposure pathways that could result in unacceptable risks are being addressed through institutional controls. However, in order to be protective in the long term the warning sign at SWMU 31 should be replaced.

The remedy for OU 7 is protective of human health and the environment. Exposure pathways that could result in unacceptable risks are being controlled with institutional controls.

The remedy for OU 8 currently protects human health and the environment because exposure pathways to soils by depot and construction workers at SWMU 8 have been eliminated by the removal and treatment of the lead contaminated soil. The treated soil was placed in a CAMU. All remaining exposure pathways that could result in unacceptable risks at OU 9 SWMUs are being controlled through institutional controls. However, in order for the remedy to be protective in the long term the warning signs at SWMU 6 should be replaced and the fence should be repaired.

The remedy for OU 9 currently protects human health and the environment because exposure pathways to soils by depot and construction workers at SWMU 23 have been eliminated by removal and disposal of the PCB and cPAH contaminated soil. All remaining exposure pathways that could result in unacceptable risks at OU 9 SWMUs are being controlled through institutional controls. However, in order to be protective in the long-term vegetation should be removed from in front of the gate to allow for it to be locked at SWMU 40 and the direction of the warning sign at SWMU 7 should be changed to allow visibility to personnel approaching the SWMU.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Tooele Army Depot (North)		
EPA ID: UT3213820894		
Region: 8	**State:** UT	**City/County:** Tooele/Tooele

SITE STATUS	
NPL Status: Final	
Multiple OUs? Yes	**Has the site achieved construction completion?** No

REVIEW STATUS
Lead agency: Other Federal Agency. **If "Other Federal Agency" was selected above, enter Agency name:** US Army
Author name (Federal or State Project Manager): Nicholas Montgomery
Author affiliation: TEAD
Review period: October 2017 – March 2018
Date of site inspection: November 6-8, 2017
Type of review: Statutory
Review number: 4
Triggering action date: March 18, 2013
Due date *(five years after triggering action date)*: March 18, 2018

Five-Year Review Summary Form (continued)

Issues/Recommendations

OU(s) without Issues/Recommendations Identified in the Five-Year Review:
OU 7

Issues and Recommendations Identified in the Five-Year Review:

OU(s):	Issue Category: Institutional Controls			
4, 8	**Issue:** No warning sign was observed at SWMU 31. Warning signs at SWMU 6 were extremely faded and unreadable.			
	Recommendation: Replace the warning signs at SWMUs 31 and 6.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	TEAD	EPA	June 2018

OU(s):	Issue Category: Institutional Control			
8	**Issue:** Fence surrounding SWMU 6 is damaged at the entrance which does not allow for the gate to be locked.			
	Recommendation: Repair damaged fence.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	TEAD	EPA	June 2018

OU(s):	Issue Category: Institutional Control			
9	**Issue:** The text of the warning sign is not visible to personnel approaching SWMU 7.			
	Recommendation: Change the direction of warning sign at SWMU 7 to allow visibility to personnel.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	TEAD	EPA	June 2018

OU(s):	Issue Category: Institutional Control

9	**Issue:** The front gate of SWMU 40 was found open and unlocked. The gate could not be closed and locked due to overgrown vegetation in front of the gate.			
	Recommendation: TEAD should cut down vegetation in front of gate to allow for closure.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	TEAD	EPA	June 2018

Protectiveness Statement(s)		
Operable Unit: 4	*Protectiveness Determination:* Short-term Protective	*Addendum Due Date (if applicable):* Click here to enter date.
Protectiveness Statement: The remedy for OU 4 currently protects human health and the environment because exposure pathways that could result in unacceptable risks are being addressed through institutional controls. However, in order to be protective in the long term the warning sign at SWMU 31 should be replaced.		

Protectiveness Statement(s)		
Operable Unit: 7	*Protectiveness Determination:* Protective	*Addendum Due Date (if applicable):* Click here to enter date.
Protectiveness Statement: The remedy for OU 7 is protective of human health and the environment. Exposure pathways that could result in unacceptable risks are being controlled with institutional controls.		

Protectiveness Statement(s)		
Operable Unit: 8	*Protectiveness Determination:* Short-term Protective	*Addendum Due Date (if applicable):* Click here to enter date.
Protectiveness Statement: The remedy for OU 8 currently protects human health and the environment because exposure pathways to soils by depot and construction workers at SWMU 8 have been eliminated by the removal and treatment of the lead contaminated soil. The treated soil was placed in a CAMU. All remaining exposure pathways that could result in unacceptable risks at OU 9 SWMUs are being controlled through institutional controls. However, in order for the remedy to be protective in the long term the warning signs at SWMU 6 should be replaced and the fence should be repaired.		

Protectiveness Statement(s)		
Operable Unit: 9	*Protectiveness Determination:* Short-term Protective	*Addendum Due Date (if applicable):* Click here to enter date.

Protectiveness Statement:

The remedy for OU 9 currently protects human health and the environment because exposure pathways to soils by depot and construction workers at SWMU 23 have been eliminated by removal and disposal of the PCB and cPAH contaminated soil. All remaining exposure pathways that could result in unacceptable risks at OU 9 SWMUs are being controlled through institutional controls. However, in order to be protective in the long-term vegetation should be removed from in front of the gate to allow for it to be locked at SWMU 40 and the direction of the warning sign at SWMU 7 should be changed to allow visibility to personnel approaching the SWMU.

Five-Year Review Report

I. Introduction

The U.S. Army Corps of Engineers, on behalf of the Tooele Army Depot (TEAD) Environmental Office and Army Environmental Command, has conducted the fourth five-year review of remedial actions implemented at the TEAD, Tooele, Utah. This review was conducted for the period beginning March 2013 to March 2018.

The purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings, and conclusions are documented in five-year review reports such as this one. In addition, FYR reports identify issues found during the review and document recommendations to address them as applicable.

This five year review was prepared pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP)(40 CFR Section 300.430(f)(4)(ii)), and considering EPA policy. CERCLA §121(c), as amended by SARA, states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented.*

Under the NCP, the Code of Federal Regulations (CFR) states, in 40 CFR §300.430(f)(4)(ii):

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after initiation of the selected remedial action.*

This is the Fourth FYR for the Tooele Army Depot (TEAD) Superfund Site. The triggering action for this statutory review is the completion of the third review in March of 2013. The FYR has been prepared due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

All OUs located on TEAD or the Base Realignment and Closure (BRAC) parcel are addressed under CERCLA or the Resource Conservation and Recovery Act (RCRA). OUs 4-10 & 15-16 are being addressed under CERCLA. OUs 1-3 & 11-14 are being addressed under Utah Resource Conservation and Recovery Act (RCRA) authority. This five-year review only includes the OUs being addressed under CERCLA.

The following sites have achieved a condition of UU/UE and are not assessed in this

review:

- OU 4 SWMU 32
- OU 5 SWMU 17
- OU 6 SWMU 9
- OU 10 SWMU 41
- OU 16 TEAD-003-R-001

The ROD for OU 5 SWMU 17 specified No Action (NA). In the first FYR, it was determined that OU 5 SWMU 17 contained PCBs at concentrations above those that would allow UU/UE based on the Cleanup Action and Risk Based Closure Standards, UAC R315-101 (also known as the Utah Risk Rule) and recommended the addition of institutional controls. In the second FYR, it was recommended that an ESD be prepared to document the change in remedy from NA to IC. Since the third FYR, the State of Utah Department of Environmental Quality (UDEQ), in consultation with the EPA, conducted a review of the 1994 ROD for OU 5 SWMU 17 and concluded that institutional controls are not required and a deed restriction does not need to be recorded for the site. The additional review of the 1994 risk assessment determined that SWMU 17 adheres to the Utah Risk Rule for risk based closure with the determination that the carcinogenic risk for human health was acceptable.

Two sites (OU 6 SWMU 18 and OU 5 SWMU 33) have been deferred to administration under other federal authorities. The remaining 11 SWMUs have been closed with institutional control (IC) requirements. Remedies have been completed at all 11 sites.

Table 1 of this document identifies the Operable Units (OUs) addressed under the Federal Facilities Agreement (FFA) at TEAD as well as the sites contained in each OU.

II. Site Chronology

Table 2 lists the chronology of events that have occurred since the inception of the TEAD Installation Restoration Program.

III. Background

Physical Characteristics

TEAD is located in the Tooele Valley in Tooele County, Utah, and approximately 30 miles southwest of Salt Lake City (Figure 1). It is approximately 4,700 feet above mean sea level (msl) in the Great Salt Lake Basin, a large interior drainage basin within the Basin and Range physiographic province. This province is characterized by large fault blocks that trend approximately north-south and form a series of interior basins bounded by fault-block mountain ranges. The Tooele Valley is bounded by the north-trending Stansbury and Oquirrh Mountains which rise from the valley floor at elevations from 5,000 to more than 10,000 feet msl. The topography of the valley floor is shaped by coalescing alluvial fans formed by debris washed from the adjacent mountains. The valley floor consists of Lake Bonneville sediments of Tertiary and Quaternary age. In ascending order, the basin fill consists of a sequence of moderately consolidated sand, gravel, silt and clay overlain by deposits of unconsolidated sand, gravel, silt

and clay. Depth to bedrock varies from 0 (surface outcrops in the northeastern corner of the facility and along the southern boundary of the installation) to more than 2,000 feet in the south-central portion of the installation. The valley is bounded to the south by the Stockton Bar and South Mountain, to the north by Grantsville and the Great Salt Lake, the east by Tooele and the Oquirrh Mountains, and the west by the Stansbury Mountains.

The area surrounding TEAD is largely undeveloped, with the exception of Tooele City (population 33,762 in 2016), Grantsville (population 9,838 in 2014) located northwest of TEAD, and Stockton (population 638 in 2014) located south of the installation. TEAD is bounded by cultivation and rangeland grazing to the west; rangeland grazing, a gravel pit operation, and the Tooele County Landfill to the south; rangeland grazing and Tooele City to the east; and rangeland grazing, a concrete/asphalt batch-plant, and a closed Tooele County Municipal Landfill to the North. Also located to the north of the installation but not directly adjacent to the boundary is a recreation complex and fairgrounds owned by Tooele County.

Land and Resource Use

TEAD was originally established in 1942 as the Tooele Ordnance Depot by the U.S. Army Ordnance Department. It was designated as TEAD-N in August 1962. In 1996, TEAD-N was designated as TEAD. TEAD has functioned as a major ammunition storage and equipment maintenance installation that supports other U.S. Army installation throughout the western United States.

Developed features at TEAD include igloos, magazines, administrative buildings, a former industrial maintenance area, military and civilian housing, roads, and former vehicle storage hardstands and other allied infrastructure. The missions of maintaining and repairing equipment were discontinued in 1995. In 1993, TEAD was placed on the list of facilities scheduled for realignment under the BRAC program. Realignment activities began in October 1993 and were completed in June 1997. Under BRAC, the vehicle and equipment maintenance and storage functions were transferred to the Red River Army Depot in Texas. Some CERCLA SWMUs are included in the BRAC portions of TEAD.

The installation currently covers 23,473 acres. Originally it included an additional 1,700 acres, which were transferred to the Redevelopment Agency of Tooele City in December 1998 under the Base Realignment and Closure (BRAC) Early Transfer Authority with contamination remaining in place. The BRAC Act cites CERCLA 120(h)(3) or (4) for property transfer conditions. Within the boundaries of the transferred property, are a number of sites on which the Army has retained liability for required environmental response actions. Use and development of these sites is controlled through a Finding of Suitability for Early Transfer (FOSET) and Covenants, Conditions, and Restrictions (CCRs) which are attached to the property deed, until such time that final corrective action has been completed. Any action taken by the developer on or near the sites must be reviewed and approved by the Army and the UDEQ. The current and future use of sites located on TEAD and under BRAC is industrial.

History of Contamination

OU 4, SWMU 31, Former Transformer Boxing Area -The Former Transformer Boxing Area was used for the temporary storage of transformers from 1979 to 1980. The area in which the transformers were stored is a flat, gravel covered area measuring 625 feet x 300 feet. No leaks or spills of polychlorinated biphenyls (PCBs) in the area were documented during the short-term storage of transformers in this area. Detection of PAHs are likely associated with earlier vehicle storage on the site. This SWMU is located on property that has been transferred to private ownership under the BRAC program.

OU 7, SWMU 5, Pole Transformer PCB Spill Site -The Pole Transformer PCB Spill Site resulted when, in 1976, a fire occurred in a pole mounted electrical transformer. During the fire, the transformer leaked PCB containing oil to the surrounding soils.

OU 8, SWMU 6, Old Burn Area -The Old Burn Area was used for testing of munitions and for burning boxes and wooden crates on the ground surface and in shallow trenches. These activities were discontinued in the 1970's. SWMU 6 is additionally being addressed under the Military Munitions Response Program (MMRP). In 2010, this SWMU was additional designated as a MRS under OU 15 to address areas and/or contaminants not addressed by the OU 8 ROD remedies.

OU 8, SWMU 8, Small Arms Firing Range -The Small Arms Firing Range was used for weapons training by the National Guard, Army Reserve, Navy and TEAD military and security personnel. The range contained 20 firing stations, with targets located at 25, 50, 100, and 300 meters. Bermed areas just in front and behind the targets were used to stop the fired rounds.

OU 8, SWMU 13, Tire Disposal Area -The Tire Disposal Area is an 11 acre pit located in the southern portion of TEAD. It was used for the disposal of vehicle tires from 1965 to 1993.

OU 8, SWMU 22, Building 1303 Washout Ponds -The Building 1303 Washout Pond was a shallow depression located in the southwestern portion of TEAD. This SWMU received wash water from Building 1303, where high-explosive bombs and projectiles were dismantled and shell casing were washed for reuse or disposal. The wash water drained from the building into an unlined ditch and flowed to the ponding area.

OU 8, SWMU 36, Old Burn Staging Area -The Old Bum Staging Area is a small pit located immediately north of the Old Burn Area (SWMU 6). The area was used to temporarily store material on its way to the Old Burn Area for disposal or testing. The OU 8, SWMU 36 ROD provides a remedy to address lead contamination in soil. In 2010, this SWMU was additional designated as a MRS under OU 15 to address areas and/or contaminants not addressed by the OU 8 ROD remedies.

OU 9, SWMU 7, Chemical Range -The Chemical Range covered approximately 550 acres running along the southern installation boundary. At the eastern point of the range was the firing point, with the bullet stop located approximately 4,800 feet to the west. A building foundation and several debris disposal trenches are all that remain at the SWMU. Chemical and pyrotechnic type munitions, excluding chemical agent filled munitions were tested and disposed of at this SWMU. Munitions testing and disposal included such items as flares, smoke grenades, smoke

pots, incendiary devices and riot control gases.

OU 9, SWMU 23, Bomb and Shell Reconditioning Building - Operations in Building 1345 began in the late 1950's and have consisted of external work on large munitions, primarily sandblasting and painting. Wastewater, which is currently comprised of boiler blow down water, has flowed from the facility into two open ditches to the north of the building.

OU 9, SWMU 35, Wastewater Spreading Area - At the Wastewater Spreading Area, runoff and wastewater from a former housing area, now part of the TEAD horse stable complex, was discharged through two culverts into two unlined ditches. The ditches discharged to a relatively flat spreading area.

OU 9, SWMU 40, AED Test Range – The Ammunition and Engineering Directorate (AED) Test Range is located in the northwestern portion of the installation and has been used extensively in the past for the testing of munitions, bombs, and rocket motors. AED closed the area in September 1995. This SWMU consists of several bermed revetments, a drop tower and a deactivation furnace, of which only the foundation remains. The deactivation furnace was used to test conveyor spacing in relationship to the design of such systems. Fragments of propellant, UXO and spent munitions have been found on the surface throughout the SWMU.

Initial Response

OU 4, SWMU 31, Former Transformer Boxing Area – No initial response was performed on this site.

OU 7, SWMU 5, Pole Transformer PCB Spill Site – At the time of the release, the oil containing soils were excavated in an area adjacent to the pole. The excavation measured approximately 5 feet long x 5 feet wide and 3 feet deep. Eleven 55 gallon drums of soil were collected and removed from the SWMU. The excavated area was not backfilled at the time the cleanup occurred.

OU 8, SWMU 6, Old Burn Area – One primary trench, known as the Former Bum Trench, was delineated through test pit excavations. Although the trench still contained metal debris and spent or destroyed munitions, it was subsequently backfilled with soil and re-graded.

OU 8, SWMU 8, Small Arms Firing Range – No initial response was performed on this site.

OU 8, SWMU 13, Tire Disposal Area – The tires were removed from the SWMU in 1993.

OU 8, SWMU 22, Building 1303 Washout Ponds – No initial response was performed on this site.

OU 8, SWMU 36, Old Burn Staging Area – No initial response was performed on this site.

OU 9, SWMU 7, Chemical Range – An open trench was over excavated in November 1997 and February 198. Approximately 80 tons of soil and debris was removed from the trench in the area

of the two test pits.

OU 9, SWMU 23, Bomb and Shell Reconditioning Building – PAH and PCB contaminated soils were excavated to a depth of 2.25 feet and disposed of at the Clean Harbors Grassy Mountain disposal facility near Knolls, in Tooele County, Utah.

OU 9, SWMU 35, Wastewater Spreading Area – Soils high in pesticides were removed from the culvert area in 2003 as part of a removal action at SWMU 52D, a site adjacent to SWMU 35.

OU 9, SWMU 40, AED Test Range – A perimeter fence was installed in October 2003.

Basis for Taking Action

OU 4, SWMU 31, Former Transformer Boxing Area – Surface soil samples were collected to determine whether contamination existed as a result of the storage of transformers at SWMU 31. No PCBs were detected in surface soil. Low levels of polycyclic aromatic hydrocarbons (PAHs) were detected in surface soil; however these detections were below risk-based standards for industrial use. Under the reasonably anticipated future land use (industrial), no COCs were identified at SWMU 31. However, the total cancer risk level for potential future residential land use required management under the Utah Administrative Code (UAC) R315-101.

OU 7, SWMU 5, Pole Transformer PCB Spill Site – The remedial investigation revealed low detectable concentrations of PCBs were present in three of four of the surface soil samples and in one of the subsurface soil samples collected in the excavation area. PCBs were not detected in subsurface samples collected at depths of up to 5 feet around the perimeter of the excavation. Detectable concentrations of polychlorinated dibenzodioxins and polychlorinated dibenzofurans were also present in most of the samples collected. These contaminants are presumably the result of combustion of PCBs. The human health risk assessment determine the threat to public health and the environment is minimal due to the low contaminant concentrations of PCBs detected at SWMU 5. A soil cover was placed in order to reduce the potential for human and fauna exposure to contaminants and comply with TSCA standards for back-filling excavated spill areas with clean soil. However, the first FYR revealed that the SWMU did not meet risk based closure and required site management under UAC R315-101.

OU 8, SWMU 6, Old Burn Area – The COCs in soil were identified as lead and 2,4-Dinitrotoluene (2,4-DNT). Risks to future construction workers required active remediation. However, residual risk to potential future residents required management under the Utah Administrative Code (UAC) R315-101

OU 8, SWMU 8, Small Arms Firing Range – The COC was identified as lead in soil. Elevated predicted blood lead levels and potential adverse ecological effects required active remediation. However, residual risk to potential future residents required management under the Utah Administrative Code (UAC) R315-101.

OU 8, SWMU 13, Tire Disposal Area – No elevated cancer risks or hazards were identified for the Depot worker. Elevated risks for chloromethane were identified for potential future residents

and required management under the Utah Administrative Code (UAC) R315-101.

OU 8, SWMU 22, Building 1303 Washout Ponds – No elevated cancer risks or hazards were identified for the Depot worker. Slightly elevated cancer risks due to TNT were identified for potential future residents and required management under the Utah Administrative Code (UAC) R315-101.

OU 8, SWMU 36, Old Burn Staging Area – No elevated risks or hazards were identified for the Deport worker exposed to contaminated soil. Elevated hazards were identified for potential future residents and required management under the Utah Administrative Code (UAC) R315-101.

OU 9, SWMU 7, Chemical Range – The COC is beryllium. There are no unacceptable human health cancer risks or hazards for the depot (military) worker exposed to soil at SWMU 7. However, elevated risks were identified for the hypothetical future onsite resident and required management under the Utah Administrative Code (UAC) R315-101.

OU 9, SWMU 23, Bomb and Shell Reconditioning Building – The COCs are PAHs and PCBS found in the drainage ditches stemming from each building. There are no unacceptable human health cancer risks or hazards for the depot worker exposed to soil at SWMU 23. However, elevated risks were identified for the hypothetical future onsite resident and required management under the Utah Administrative Code (UAC) R315-101.

OU 9, SWMU 35, Wastewater Spreading Area – The COC is pesticides (PCB) in soil. The identified risks and hazards to the depot worker are below those specified in UAC R315-101 as requiring evaluation of active remediation. However, the human health cancer risks for the TEAD worker and the hypothetical future resident exposed to soil at SWMU 40 are between 10^{-6} and 10^{-4} and required management under the Utah Administrative Code (UAC) R315-101.

OU 9, SWMU 40, AED Test Range – The COCs are RDX and 2,4-DNT in the soil. The identified risks and hazards to the depot worker are below those specified in UAC R315-101 as requiring evaluation of active remediation. However, the human health cancer risks for the TEAD worker and the hypothetical future resident exposed to soil at SWMU 40 are between 10^{-6} and 10^{-4} and required management under the Utah Administrative Code (UAC) R315-101.

IV. Federal Facilities Agreement (FFA)/CERCLA Remedial Actions

Remedy Selection

Records of Decision (RODs) for TEAD were signed in September 1994 for OUs 5, 6, 7, and 10. The ROD for OU 4 was signed in January 2003. The ROD for OU 8 was signed in March 2004. The ROD for OU 9 was signed in September 2008. An ESD was signed in March 2010 for OU 8 SWMU 6 changing the remedy of excavating and solidification/stabilization (SIS) of lead contaminated soil and placing the material in a CAMU. The remedy was changed to excavation and off-site disposal of soil and debris in an appropriately permitted hazardous waste Treatment, Storage and Disposal Facility (TSDF) due to uncertainty associated with

stabilization of leachable lead in debris from this site, and the general safety hazards inherent in the implementation associated with handling and applying the large volumes of phosphoric acid that would be needed for treatment.

The selected remedies for the SWMUs are presented in Table 4. Many of the SWMUs presented risks that were within the acceptable cancer risk range, below a hazard index of 1.0, and had estimated blood-lead levels less than EPA standards. However, under Utah Corrective Action Cleanup Standards Policy, Rule 315-101 (the Utah Risk Rule), any SWMU with a potential residential risk greater than $1X10^{-6}$ or a hazard index (HI) greater than 1, must have site management in place as a minimum corrective action. This State RCRA requirement is incorporated into the RODs as an ARAR. As a result, all SWMUs included in this review have institutional controls as a component of the selected remedy.

The Remedial Action Objectives (RAOs) were not presented in the RODs for OU 4 and OU 7. The RAOs for OU 8 and OU 9 were not clearly presented in their perspective RODs. According to both the OU 8 ROD and the OU 9 ROD, the "primary qualitative RAO is to protect human health and the environment". All of the OU RODs equate RAOs with the FRGs. A listing of COCs and FRGs for each of the OUs can be found in Table 6.

Remedy Implementation

Remedies have been implemented as specified in the RODs for all OUs. All remedies were implemented as specified in the RODs prior to the third Five-Year Review.

Operable Unit 4

SWMU 31

No unacceptable risk to depot or construction workers were identified, as it met the criteria of EPA Guidance on Remedial Action for Superfund Sites; however, it does not meet the requirements for risk-based closure under Utah Administrative Code (UAC) R315-101 as risks exceed 1×10^{-6} for residential use. A Remedial Design for Institutional Control (RDIC) was implemented in 2005 and revised in 2012 to prevent residential use and offsite transportation of contaminated soil from the site. The RDIC chose the following mechanisms to implement land use controls (LUCs):

- Deed Restrictions
- Annual Inspection
    - Signage
- Five Year Reviews

Operable Unit 7

SWMU 5

Remedial design associated with the Pole Transformer PCB Spill Site (Site 5) was completed in November 1995 (JE, 1995). The design called for filling of the hole created during initial cleanup, placement of 10 inches of clean soil and gravel as a cover. Remedial action at this site was completed as specified in the ROD and remedial design. However, during the first Five Year Review, dated September 2002, it was determined that even though Site 5 had been closed requiring No Further Action, as it met the criteria of EPA Guidance on Remedial Action for Superfund Sites with PCB Contamination of 1 part per million (ppm) for residential land use and 10 to 25 ppm for industrial use, it does not meet the requirements for risk-based closure under Utah Administrative Code (UAC) R315-101 as risks exceed 1×10^{-6} for residential use. A Remedial Design for Institutional Control (RDIC) was implemented in 2005 and revised in 2012 to prevent residential use and offsite transportation of contaminated soil from the site. The RDIC chose the following mechanisms to implement land use controls (LUCs):

- Site Warning Signs
- Installation Master Plan
- Annual Inspection
- Five Year Reviews

Operable Unit 8

SWMUs 13, 22, & 36

No unacceptable risk to depot or construction workers were identified, as they met the criteria of EPA Guidance on Remedial Action for Superfund Sites; however, they did not meet the requirements for risk-based closure under Utah Administrative Code (UAC) R315-101. A Remedial Design for Institutional Control (RDIC) was implemented in 2005 and revised in 2012 to prevent residential use and offsite transportation of contaminated soil from the site. The RDIC chose the following mechanisms to implement land use controls (LUCs) for each of the SWMUs:

- Site Warning Signs
- Installation Master Plan
- Annual Inspection
- Five Year Reviews

SWMU 6

The ROD specified FRG cleanup levels of 1,800 mg/kg and 4.7 mg/kg for lead and 2,4-DNT, respectively. The lead FRG was based on blood lead modeling using the EPA Adult Lead Model (ALM). The 2,4-DNT FRG is a risk-based goal based on current and anticipated future land use and potential receptor assumptions, exposure pathways, results of the human health risk assessment, health effects criteria, and background sample results.

An ESD was signed in March 2010 for OU 8 SWMU 6 changing the remedy from excavating and solidification/stabilization of lead contaminated soil and placing the material in a CAMU. The remedy was changed to excavation and offsite disposal of soil and debris in an

appropriately permitted hazardous waste Treatment, Storage and Disposal Facility (TSDF) due to uncertainty associated with stabilization of leachable lead in debris from the site, and the general safety hazards inherent in the implementation associated with handling and applying the large volumes of phosphoric acid that would be needed for treatment.

The initial remedial action removed 2,4-DNT contaminated soil and took place from September 27,2004 to December 29, 2004. Approximately 124 yd^3 (bank) of soil were excavated and disposed of offsite. Confirmatory samples were collected from the floor of the excavation at the sampling locations. Sampling and analysis for purpose of the excavation confirmation were performed in accordance with the Sampling and Analysis Plan (SAP) (DRS, June, 2(02) included as part of the RAWP and the Final Chemical Data Quality Management Plan (CDQMP) (USACE, 2004). The 2,4-DNT concentrations ranged from undetected to 38 µg/kg. All of the confirmatory samples were found to have concentrations of 2,4-DNT less than the FRG cleanup level of 4.7 mg/kg (ECC, 2008).

The second remedial action removed lead contaminated soil and debris and took place from April 5, 2010 to May 19, 2010. A total 2597.62 tons of hazardous and non-hazardous waste were excavated from the Former Burn Trench and the area adjacent to the trench and disposed of in the TSDF. Confirmatory samples were collected from the side wall and bottom of the excavation in accordance with the Remedial Action Work Plan (RAWP). The lead soil samples were analyzed following the procedures established in the Quality Assurance Project Plan in the RAWP (Parsons, 20 l0b).

Confirmation testing relied primarily on X-Ray Fluorescence (XRF) tests with laboratory confirmation analyses for total lead to provide a quality control check on the XRF measurements. Confirmation XRF test readings in the Former Burn Trench ranged from 5.3 to 596.6 ppm lead, with an average value of 65.0 ppm lead. Confirmation XRF test readings from the area adjacent to the trench ranged from 7.0 to 338.3 ppm lead with an average value of 124.2 ppm lead. The confirmation XRF test readings and samples show that the in place soil samples had lead concentrations less than the FRG cleanup level of 1,800 mg/kg (Parsons, 2011).

The contaminated soil from the 2004 remedial action was disposed of at the Grassy Mountain landfill in Aragonite, Utah. The contaminated soil from the 2010 remedial action was disposed of at the Clean Harbors Grassy Mountain TSDF.

Additionally, the SWMU did not meet the requirements for risk-based closure under Utah Administrative Code (UAC) R315-101. A Remedial Design for Institutional Control (RDIC) was implemented in 2005 and revised in 2012 to prevent residential use and offsite transportation of contaminated soil from the site. The RDIC chose the following mechanisms to implement land use controls (LUCs):

- Site Warning Signs
- Installation Master Plan
- Annual Inspection
- Five Year Reviews

SWMU 8

The ROD specified a FRG cleanup level of 1,800 mg/kg for lead. The lead FRG was based on blood lead modeling using the EPA Adult Lead Model (ALM) as explained in Attachment 5.

The remedial action removed lead contaminated soil and debris and took place from September 27, 2004 to December 29, 2004. A total 2,793 yd^3 (bank) of soil were excavated from the SWMU 8 berms. Confirmatory samples were collected from the entire excavation areas in accordance with the requirements stated in the RAWP. After completion of the first cut throughout the site, confirmatory soil samples were collected from the floors of all sections and from the sidewalls of nine sections and sent for analysis for total lead to ensure that all contaminated soil greater than the FRG of 1,800 mg/kg was removed. Only one confirmatory soil sample collected was found to have a concentration that exceeded the FRG. The contractor returned to this area and excavated another 1-foot from the entire floor of the area. Another confirmatory soil sample was collected and found to have a lead concentration less than the FRG. The analytical results of the in place soil samples ranged from 8.06 mg/kg to 77.2 mg/kg lead in soil. The analytical results of these samples indicated that the lead concentration in the in place soil was below the FRG cleanup level of 1,800 mg/kg.

The lead contaminated soil was mixed with cement kiln dust as the active ingredient for solidification/stabilization (S/S). Prior to placement in the CAMU confirmation samples were collected from the stockpiles of treated soil. Confirmation samples were collected from each stockpile to ensure that the treated soil met the treatment criteria of less than 75 mg/L for SPLP lead and greater than a pH level of 8. As prescribed in the RAWP, each confirmatory sample was a composite sample made up of five grab samples of equal portion collected randomly from throughout the stockpile and each composite confirmatory sample was analyzed for synthetic precipitation leachate procedure (SPLP) lead. As stipulated in the RAWP, the lead contaminated soil was to be treated to meet the treatment criteria of less than 75 mg/L for SPLP lead and greater than a pH level of 8. The analytical results for all samples collected from the treated soil stockpiles were found to meet the treatment criteria of less than 75 mg/L for SPLP lead with a sampled SPLP lead range of <0.1 mg/L to 1.76 mg/L, and greater than a pH level of 8 with a sampled pH range of 12.4 to 12.7.

The sampling and analysis for purpose of the excavation confirmation, treatment confirmation, and waste characterization was performed in accordance with the Sampling and Analysis Plan (DRS, June, 2002) included as part of the RAWP and the Final Chemical Data Quality Management Plan, Tooele Army Depot (USACE, 2004).

Additionally, the SWMU did not meet the requirements for risk-based closure under Utah Administrative Code (UAC) R315-101. A Remedial Design for Institutional Control (RDIC) was implemented in 2005 and revised in 2012 to prevent residential use and offsite transportation of contaminated soil from the site. The RDIC chose the following mechanisms to implement land use controls (LUCs):

- Site Warning Signs
- Installation Master Plan
- Annual Inspection
- Five Year Reviews

Operable Unit 9

SWMUs 7

No unacceptable risk to depot or construction workers were identified, as they met the criteria of EPA Guidance on Remedial Action for Superfund Sites; however, they did not meet the requirements for risk-based closure under Utah Administrative Code (UAC) R315-101. A Remedial Design for Institutional Control (RDIC) for OU 9 was implemented in 2005 and revised in 2012 to prevent residential use, transfer of soils to a residential area, long term worker exposure to SWMUs 35 and 40, and construction worker exposure to SWMU 40. The RDIC chose the following mechanisms to implement land use controls (LUCs) for each of the SWMUs:

- Site Warning Signs
- Installation Master Plan
- Annual Inspection
- Five Year Reviews
- Construction Activities

SWMU 23

The remedial action at SWMU 23 removed PAH and PCB contaminated soil and took place from August 19, 2008 to October 22, 2008. An initial excavation removed 44 yd^3. A second excavation took place took place within the excavation area where the initial sample analyses reported above the FRGs. Approximately 18 yd^3 of soil were excavated. The excavated soil from the two excavations were disposed of offsite.

The sampling and sample analysis were conducted in accordance with the Remedial Action Plan and the Sampling and Analysis Plan (AEEC, 2005). The reporting limits (RL) for several compounds were above the FRGs. However, the laboratory reported estimated data to the method detection limit (MDL), and all MDLs were less than the FRGs. The sampling results less than the reporting limit but greater than the MDL were qualified as an "estimated value". The analytical data (Appendix B of the Remedial Action Completion Report [RACR]) along with the Quality Control Summary Report (Appendix A of the RACR) provide the documentation that verifies the data quality objectives have been achieved. The Quality Control Summary Report included as Appendix B of the SWMU 23 RACR concluded that all data should be considered usable for their intended purposes (ITSI, 2009).

Additionally, the SWMU did not meet the requirements for risk-based closure under Utah Administrative Code (UAC) R315-101. A Remedial Design for Institutional Control (RDIC) was implemented in 2005 and revised in 2012 to prevent residential use, transfer of soils to a

residential area, long term worker exposure to SWMUs 35 and 40, and construction worker exposure to SWMU 40. The RDIC chose the following mechanisms to implement land use controls (LUCs):

- Site Warning Signs
- Installation Master Plan
- Annual Inspection
- Five Year Reviews
- Construction Activities

SWMU 35

No unacceptable risk to depot or construction workers were identified that required active remediation at the site; however, elevated risks did not meet the requirements for risk-based closure under Utah Administrative Code (UAC) R315-101 and required institutional controls. A Remedial Design for Institutional Control (RDIC) for OU 9 was implemented in 2005 and revised in 2012 to prevent residential use, transfer of soils to a residential area, long term worker exposure to SWMUs 35 and 40, and construction worker exposure to SWMU 40. The RDIC chose the following mechanisms to implement land use controls (LUCs) for each of the SWMUs:

- Site Warning Signs
- Installation Master Plan
- Annual Inspection
- Five Year Reviews
- Construction Activities

SWMU 40

No unacceptable risk to depot or construction workers were identified that required active remediation at the site; however, elevated risks did not meet the requirements for risk-based closure under Utah Administrative Code (UAC) R315-101 and required institutional controls. A Remedial Design for Institutional Control (RDIC) for OU 9 was implemented in 2005 and revised in 2012 to prevent residential use, transfer of soils to a residential area, long term worker exposure to SWMUs 35 and 40, and construction worker exposure to SWMU 40. The RDIC chose the following mechanisms to implement land use controls (LUCs) for each of the SWMUs:

- Site Warning Signs
- Installation Master Plan
- Annual Inspection
- Five Year Reviews
- Construction Activities

System Operations/Operation and Maintenance (O&M)

Of the remedies in place at the time of this review, no operations and maintenance has been required with the exception of annual inspections. At the time of this review, no remedial actions are in place that required program funding for operations and maintenance of the remedy. Annual site inspections are performed by Army staff at a minimal cost. Twelve SWMUs were inspected once per year for FY 2013 – FY 2016 and a report was generated. Only 11 SWMUs are inspected once per year for FY 2017 and continuing. Estimated staff labor costs for annual site inspection and reporting are shown below.

Dates	O&M Cost Rounded to nearest $100
01/01/2013 – 12/31/2013	$6000
01/01/2014 – 12/31/2014	$6000
01/01/2015 – 12/31/2015	$6000
01/01/2016 – 12/31/2016	$6000

V. Progress Since the Last Review

Protectiveness Statements from 3rd FYR

Operable Unit 4

This operable unit includes SWMU 31

The remedy for OU 4 is protective in the short-term because exposure pathways that could result in unacceptable risks are being controlled through institutional controls. In order to be protective in the long term the RDIC LUC Site Map should be corrected, continued monitoring of the LUCs should take place, and TEAD will need to periodically confirm the current ownership of the property and confirm that the property owner is aware of the deed restrictions. The review team inspected the site and reviewed site documents and data and did not identify potential or actual exposure to be clearly present at the site. Institutional controls have been implemented and no violations of the land use restrictions were observed.

Status of Recommendations

TEAD corrected the Remedial Design for Institutional Control (RDIC) LUC Site Map for SWMU 31 and implemented an annual letter notification to property owners in conjunction with LUC annual inspections to notify the property owners of the deed restrictions.

Operable Unit 5

This operable unit includes SWMU 17

The remedy for OU 5 is protective in the short-term because exposure pathways that could result in unacceptable risks are being controlled through institutional controls. To be protective in the long term the RDIC LUC Site Map needs correction, TEAD will need to verify and implement if necessary the required deed restrictions, and an ESD is needed to incorporate

the Cleanup Action and Risk Based Closure Standards. The review team inspected the site and reviewed site documents and data and did not identify potential or actual exposure to be clearly present at the site. Institutional controls have been implemented and no violations of the land use restrictions were observed.

Status of Recommendations

It was determined that an explanation of significant difference (ESD) was not needed due to the fact that ICs do meet the intention of the Risk Rule by providing routine attention to SWMU 17 during annual IC inspection. However, the State of Utah concluded that institutional controls are not required and a deed restriction should not be recorded for SWMU 17. This decision was reached in consultation with the Environmental Protection Agency (EPA) and is based on their review of the ROD and risk assessment. The additional review of the 1994 risk assessment determined that SWMU 17 adheres to the Utah Risk Rule for risk based closure with the determination that the carcinogenic risk for human health was acceptable.

Operable Unit 7

This operable unit includes SWMU 5

The remedy for OU 7 is protective in the short-term because exposure pathways that could result in unacceptable risks are being controlled through institutional controls. A soil and gravel cap has been constructed at the site, removing a potential exposure pathway to the PCB, dioxin/dibenzofuran contaminated soils. To be protective in the long term, an ESD is needed to incorporate the Risk Rule and the LUCs. The review team inspected the site and reviewed site documents and data and did not identify potential or actual exposure to be clearly present at the site. Institutional controls have been implemented and no violations of the land use restrictions were observed.

Status of Recommendations

It was determined that an ESD was not needed for SWMU 5 after further research was conducted by the EPA in consultation with the State of Utah. It was determined the issue will be marked as "considered but not implemented" in the Superfund database based upon consideration of the FYR issues and the guidance of the ROD. In the third FYR response letter from TEAD to EPA (2015), it included correspondence from Patricia Smith with EPA stating, "It is noted that ICs are in place, and these ICs meet the intention of the Utah Cleanup Action and Risk Based Closure Standards by providing routine attention to those areas in SWMUs 5 and 17 between 10^{-4} and 10^{-6} risk during annual IC inspection. The annual review of ICs takes place at all SWMUs with ICs under the RCRA permit".

Operable Unit 8

This operable unit includes SWMUs 6, 8, 13, 22, and 36

The remedy for OU 8 is protective in the short-term because exposure pathways to soils at SWMU 8 that could result in unacceptable exposure to depot workers and construction workers have been eliminated by removal and treatment of the lead contaminated soil, the treated soil was placed in a CAMU and institutional controls are in use. To be protective in the long term, the RDIC should be updated and signage should be replaced. The review team inspected the sites and reviewed site documents and data and did not identify potential or actual exposure to be clearly present at the sites. Institutional controls have been implemented and no violations of the land use restrictions were observed.

Status of Recommendations

The RDIC was updated in March of 2015 to reflect time frame for replacement of signage. Warning signs have been replaced.

Operable Unit 9
This operable unit includes SWMUs 7, 23, 35, and 40

The remedy for OU 9 is protective in the short-term because exposure pathways to soils at SWMU 23 that could result in unacceptable exposure to depot workers and construction workers have been eliminated by removal and disposal of the PCB and PAH contaminated soil. All remaining exposure pathways that could result in unacceptable risks at OU 9 SWMUs are being controlled through institutional controls. To be protective in the long term, the Master Plan LUC site map should be updated and signage should be replaced. The review team inspected the sites and reviewed site documents and data and did not identify potential or actual exposure to be clearly present at the sites. Institutional controls have been implemented and no violations of the land use restrictions were observed

Status of Recommendations

The Master Plan LUC site map was updated in February 2015 to reflect which land use restrictions are present for each of the sites and to correct references. The RDIC was updated in March 2015 to reflect the time frame for replacement of signage and warning signs were replaced.

VI. Five-Year Review Process

Administrative Process

The TEAD fourth five-year review was conducted and written by:

- Sararina Huff, Chemist, U.S. Army Corps of Engineers, Savannah District
- James Waldo, Geologist, U.S. Army Corps of Engineers, Savannah District
- Frank Cerio, Engineer, U.S. Army Corps of Engineers, Wilmington District

The five-year review consisted of the following activities: A review of relevant documents and evaluation of the data (see Attachment 1), a site inspection, and interviews. Copies of the report will be maintained in public repositories and TEAD as part of the administrative record.

Community Notification and Involvement

A public notice announcing the beginning of the Fourth Five-Year Review was published in the Tooele Transcript-Bulletin newspaper on November 14, 2017. The public notice invited questions or comments from the community concerning TEAD. No comments or questions were submitted to TEAD as a result of this public notice. A proof of publication of the public notice is included as Attachment 7. Additionally, a public notice was verbally announced at the RAB on November 8, 2017. Copies of the review will be provided to the J. Willard Marriott Library at the University of Utah and TEAD as part of the administrative record.

Document Review

Reports and data generated through October 2017 were reviewed as part of the fourth five-year review of Tooele Army Depot. A list of these documents and references is included in this report as Attachment 1. A master site status table can be found in Attachment 4. No additional data has been collected at the sites since the RODs were issued.

As part of the document review, the local repositories for site documents were found to be located at TEAD and at the J. Willard Marriott Library at the University of Utah. During the visit at the J. Willard Marriott Library, a search was made to try to locate the site RODs, ESDs, and five-year reviews. All documents were found. The J. Willard Marriott Library confirmed that they continue to receive documentation from the Tooele Army Depot and will continue to participate as a local repository for site documents.

Site Inspections

A site inspection was performed on November 6-9, 2017, by chemist Sararina Huff and geologist James Waldo of USACE, Savannah District and was accompanied by Nicholas Montgomery of TEAD. The site descriptions, photographs, and site inspection checklist are provided as Attachment 2. Table 5 provides a summary of the inspections. The review team was able to visit all 11 SWMUs. All sites were inspected with no evidence of use inconsistent with the institutional controls specified for the sites. The sites and the surrounding areas are all either vacant with no apparent use, active use by TEAD, or in industrial/commercial use.

SWMUs 6 and 40 potentially have unexploded ordnance (UXO) on the sites. The perimeter of the fence for SWMU 6 was inspected and a breach at the front gate was detected. The perimeter of the fence for SWMU 40 was not inspected due to the surrounding land is being used actively for disposal of munitions. The gate to SWMU 40 was found open and appears to have been open for a lengthy time due to vegetation growth in front of the gate.

The RDICs require warning signs at all 11 sites. A warning sign was not observed at SWMU 31. Warning signs at SWMU 6 are extremely faded and warning signs at SWMUs 13 and 35 were not visible due to them lying on the ground.

SWMUs 5, 7, 22, 23, 35 do not have defined physical boundaries. Currently, there is only one sign at each of the SWMUs located at what would be the front entrance. However, the SWMUs can be accessed from multiple directions and the boundaries of the SWMUs could not be identified when conducting site inspection.

Interviews

The review team coordinated the list of potential interviewees with Nicholas Montgomery of TEAD, and interviewed each of the people listed in Attachment 3 by calling or providing interview forms by email. Overall, each interviewee was satisfied with the current work being performed at TEAD and did not express any concerns. Interview record forms are provided in Attachment 3.

VII. Technical Assessment

The five-year review must determine whether the remedy at a site is protective of human health and the environment. The EPA guidance describes three questions used to provide a framework for organizing and evaluating data and information, and to ensure all relevant issues are considered when determining the protectiveness of a remedy. These three questions were answered separately for each OU. Attachment 5 presents an evaluation for all of the sites of the assumptions used to evaluate the risk to human health at the time of the remedy.

Operable Unit 4

Question A: Are the remedies functioning as intended by the decision documents?

The remedies at OU 4 are functioning as intended. OU 4 consists of SWMU 31. SWMU 31 contains PAHs at concentrations above those that would allow UU/UE. The selected remedy for SWMU 31 was institutional control. SWMU 31 is part of the BRAC industrial area, and the site has had deed restrictions applied restricting the site use to non-residential use and prohibiting disturbing of the soils. The site is inspected annually as required in the site RDIC to verify that the deed restrictions have not been violated, and a report is provided on a set schedule. The industrial use of the site is consistent with the non-residential use restriction, and there was no evidence that soils have been removed from the site.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of remedy selection still valid?

The assumptions used at the time of the remedy are still valid.

Changes in standards, newly promulgated standards, and TBC

The selected remedy was driven by the Cleanup Action and Risk Based Closure Standards (UAC R315-101). The risk to industrial workers or construction workers, the reasonable future use receptors, is at an acceptable level; but there is a risk greater than 10^{-6} to a hypothetical resident. The Utah Cleanup Action and Risk Based Closure Standards requires a site

management plan when the risk is less than 10^{-4} but greater than 10^{-6} to a hypothetical resident and this requirement has not changed. There are no new relevant standards.

Changes in exposure pathways

There is no change in exposure pathway, as SWMU 31 remains in industrial use only, and the condition of the site has not changed.

Changes in toxicity

This review conducted an examination of the changes in toxicity data for site COCs. The ROD identified no COCs at SWMU 31 because risks to the current and reasonable future receptors were within the acceptable range for the reasonably anticipated future land use of industrial. Although the ROD identified no COCs for the site, the Utah Risk Rule requires site management measures to address elevated risks due to PAHs that were identified for a hypothetical future onsite resident. The ROD identified elevated risk at the site due to PAHs, but did not designate PAHs as COCs because the concentrations were below the risk-based screening criteria for industrial use, the anticipated future use for the site. The ROD did, however, specify ICs be implemented at SWMU 31 to address the PAH risks to meet the requirements of the Utah Risk Rule. Inhalation Unit Risk (IUR) values have been established for the PAHs detected at the site since the issuance of the ROD which would indicate a higher risk than that computed at the time of the ROD. The comparison of the maximum detected PAHs and the current industrial soil Regional Screening Levels (RSLs) is shown in Attachment 5, which indicates PAH levels are well below risk based screening levels and the remedy remains protective.

Changes in risk assessment methods

No standardized risk assessment methods have changed for PAHs that could affect the protectiveness of the remedy.

Question C: Has any other information come to light that could call into question the protectiveness of the remedies?

No additional information has come to light that would call into question the protectiveness of the remedy.

Operable Unit 7

Question A: Are the remedies functioning as intended by the decision documents?

The selected remedy at OU 7 is functioning as intended. OU 7 consists of SWMU 5. Although some contaminated soils were removed shortly after the PCB release in 1976, soils at SWMU 5 are still contaminated with PCB and dioxins/furans at concentrations above those that would allow UU/UE based on the Risk Rule. The selected remedy included filling the excavation with soil and covering the area with gravel and soil. No further action was required at SWMU 5 after conducting these actions. To address the issue identified in the first five-year review that the

risk for residential use at the site exceeded that acceptable under the Risk Rule, ICs were implemented at the site in the 2005 OU 7 RDIC. The second five-year review recommended an ESD be prepared to document the change in remedy; however, as a response to the recommendation again in the third five-year review, the EPA determined that OU 7 (SWMU 5) does not require an ESD. The justification is that the ICs are in place and these ICs meet the intention of the UT Cleanup Action and Risk Based Closure Standards by providing routine attention to those areas in SWMU 5 that fall between 10^{-4} and 10^{-6} risk during annual IC inspection.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of remedy selection still valid?

The selected remedy allowed for contaminated soils to remain at the site due to the acceptable level of risk, but required the affected project area from the previous excavation of the PCB contaminated soils to be filled. As previously noted in the third FYR, there have been changes in toxicity parameters used to evaluate the risk due to the dioxin and dibenzofurans for SWMU 5; however, the change does not indicate that the remedy is no longer protective. The ROD failed to identify that the risk at SWMU 5 exceeded the allowable risk specified in the Utah Risk Rule. This was identified as an issue in the first five-year review and ICs have been implemented at the site to address the risk.

Changes in standards, newly promulgated standards, and TBC

The selected remedy was driven by the Utah Risk Rule (UAC R315-101). The risk to industrial workers or construction workers, the reasonable future use receptors, is at an acceptable level; but there is a risk greater than 10^{-6} to a hypothetical resident. The Cleanup Action and Risk Based Closure Standards requires a site management plan when the risk is less than 10^{-4} but greater than 10^{-6} to a hypothetical resident and this requirement has not changed. There are no new relevant standards.

Changes in exposure pathways

There is no change in exposure pathway, as SWMU 5 remains a vacant unused site in an industrial area. The physical condition of the site has not changed. The remaining contamination is contained beneath a soil and gravel cover.

Changes in toxicity

Although the ROD identified no COCs for the site, the Utah Risk Rule requires site management measures to address elevated risks due to PCBs, dioxin and dibenzofurans that were identified for a hypothetical future onsite resident. The current recommended Toxicity Equivalence Factor (TEF) values are less than or equal to the values used in the RI for some of the dioxin-like compounds detected at SWMU 5; however, this change indicates that the risk is less than that estimated at the time of the ROD, and does not affect the protectiveness of the remedy.

Based on the current recommended TEF values a total 2,3,7,8-tetrachlorodibenzodioxin (TCDD) Toxicity Equivalence (TEQ) value of 2.5 E-5 mg/kg was computed, which exceeds the current EPA industrial soil RSL of 2.2E-5 mg/kg for 2,3,7,8-TCDD based on the Hazard Index of 1.0. The RSL is based on a target risk of 10^{-6} for cancer risk, the lower end value of EPA's acceptable cancer risk range. This indicates concentrations are below that which would cause adverse non-cancer health effects.

An inhalation RfC has been established for 2,3,7,8-TCDD since the ROD. Given that ingestion is a more significant exposure pathway for most toxicants, compounds not previously evaluated for the inhalation route, such as 2,3,7,8-TCDD at SWMU 5, likely will not change the protectiveness of the remedies in place.

Changes in risk assessment methods

No standardized risk assessment methods have changed that could affect the protectiveness of the remedy.

Question C: Has any other information come to light that could call into question the protectiveness of the remedies?

No additional information has come to light that would call into question the protectiveness of the remedy.

Operable Unit 8

Question A: Are the remedies functioning as intended by the decision documents?

The remedies at OU 8 are functioning as intended. OU 8 consists of SWMUs 6, 8, 13, 22 and 36. These five SWMUs all contain contaminants at concentrations above those that would allow UU/UE. COCs at SWMU 6 are 2,4-DNT and lead. The COC at SWMU 8 is lead. The COC at SWMU 13 is chloromethane. The COC at SWMU 22 is 2,4,6-trinitrotoluene. The COC at SWMU 36 is lead.

The selected remedies for all five SWMUs include institutional controls. For SWMUs 13, 22, and 36, IC was the only component of the remedy. All five sites are inspected annually as required in the RDIC to verify that the institutional controls have not been violated, and a report is provided on a set schedule. Institutional controls restrict the sites to non-residential use, and the industrial use of the sites is consistent with the controls.

The selected remedy for SWMU 8 included excavation of lead contaminated soil, stabilization of the soil, and placement of the soil in a CAMU. Excavation of soil on-site achieved the specified Final Remedial Goal cleanup levels. Results of performance samples collected from the stabilized soil indicate attainment of the treatment goal.

The selected remedy for SWMU 6 included excavation and offsite disposal of explosives contaminated soil, and excavation of lead contaminated soil and offsite disposal in a permitted

Treatment, Storage and Disposal Facility (TSDF). Results of confirmation samples collected indicate attainment of the cleanup goal.

- The remedial action objective for these sites has been met.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of remedy selection still valid?

There has been a change in the toxicity parameters used to evaluate the risk at SWMUs 6, 8 and 36; however, the changes do not indicate that the remedies are no longer protective.

Changes in standards, newly promulgated standards, and TBC

The selected remedy for SWMUs 13, 22, and 36 was driven by the State Cleanup Action and Risk Based Closure Standards (UAC R315-101). The risk to industrial workers or construction workers, the reasonable future use receptors, is at an acceptable level; but there is a risk greater than 10^{-6} to a hypothetical resident. The Cleanup Action and Risk Based Closure Standards requires a site management plan when the risk is less than 10^{-4} but greater than 10^{-6} to a hypothetical resident and this requirement has not changed. There are no new relevant standards.

SWMUs 6 and 8 required active remedies to address explosives and lead. Cleanup criteria were risk based, and no standards have been changed or added that would alter the cleanup criteria. However, the risk to industrial workers or construction workers, the reasonable future use receptors, is at an acceptable level after active remediation, there is a risk greater than 10^{-6} to a hypothetical resident. The Utah Risk Rule requires a site management plan when the risk is less than 10^{-4} but greater than 10^{-6} to a hypothetical resident and this requirement has not changed. There are no new relevant standards.

Changes in exposure pathways

There is no change in exposure pathway, as all five SWMUs remain in industrial use only. The physical condition of the sites has not significantly changed and soils have not been moved/reworked at these sites. Treated waste from SWMU 8 has been placed in a CAMU in which the wastes are protected from exposure by a soil cap, and this cap is being inspected and maintained under the TEAD RCRA Post Closure Permit.

Changes in toxicity

For SWMUs 13, 22 and 36, the IC remedy was not selected for the current or reasonable future receptors, workers at TEAD, rather it was selected for the hypothetical resident. OU 8 is in industrial/military use, and is expected to remain so in the future, with no residential use and no actual onsite resident. The risk to the hypothetical resident was computed to meet the requirements of the Utah Risk Rule. No COCs were identified at SWMUs 13 and 22 because risks to the current and reasonable future receptors were within the acceptable range. Although the ROD identified no COCs for the sites, the Utah Risk Rule requires site management

measures to address elevated risks due to chloromethane at SWMU 13 and 2,4,6-trinitrotoluene at SWMU 22 that were identified for a hypothetical future onsite resident. For SWMUs 6, 8 and 36 lead was identified as a COC, and for SWMU 6 2,4-DNT was identified as a COC.

The risk at SWMU 13 was due to chloromethane detected at the site. EPA no longer recognizes a cancer Slope Factor (SF) or IUR for chloromethane, and therefore there would be no increased lifetime cancer risk at SWMU 13 due to chloromethane.

For SWMU 6 the risk based FRG cleanup level for 2,4-DNT was developed based on toxicity data at the time of the RI/FS. Since that time, an IUR value has been established for 2,4-DNT. A comparison was made with the 2,4-DNT FRG for the sites and the current EPA industrial soil RSL, which is an estimate using the current toxicity data of concentrations of 2,4-DNT in an industrial soil that may warrant further investigation or site cleanup. The 2,4-DNT FRG of 4.7 mg/kg is less than the industrial soil RSL of 7.4 mg/kg, which indicates an acceptable level of risk, and the remedial goal remains protective of human health. Given that ingestion is a more significant exposure pathway for most toxicants, the incorporation of these compounds into risk considerations would not change the protectiveness of the remedy.

Changes in risk assessment methods

For SWMUs 6, 8 and 36, the EPA Adult Lead Model (ALM) was used to determine FRG cleanup levels. The maximum detected concentration of lead in the soil of SWMU 36 only slightly exceed the lead FRG, and only institutional controls were required to address lead at this site. In 2009, EPA revised the recommended model values for the background blood lead concentration (PbB) geometric mean (GM), and geometric standard deviation (GSD) of the inter-individual variability of the PbB. Using the 2009 values in the ALM would result in a higher value for the remedial goal for lead concentrations in soil. Therefore, the GM and GSD ALM values used in the 1999 FS result in a more conservative remedial goal than the updated 2009 values, and the remedy established for lead contaminated soil is more protective than necessary to achieve the 10 µg/dL blood lead concentration goal. The revised values indicate the adopted FRG cleanup levels for lead are still protective of human health.

Question C: Has any other information come to light that could call into question the protectiveness of the remedies?

No additional information has come to light that would call into question the protectiveness of the remedy.

Operable Unit 9

Question A: Are the remedies functioning as intended by the decision documents?

The remedies at OU 9 are functioning as intended. The OU 9 ROD was finalized in September 2008. OU 9 is composed of SWMUs 7, 23, 35 and 40. These four SWMUs all contain contaminants at concentrations above those that would allow UU/UE.

The selected remedies for all four SWMUs include institutional control. For SWMUs 7, 35 and 40, ICs are the only component of the remedy. All four sites are inspected annually as required in the site RDICs to verify that the institutional controls have not been violated, and a report is provided on a set schedule. Institutional controls restrict the sites to non-residential use, and the current industrial use of the sites is consistent with the controls.

The remedy at SWMU 23 included excavation and offsite disposal of carcinogenic PAH (cPAH) and PCB contaminated soil. The cPAH and PCB contaminated soil has been excavated and disposed of at an offsite disposal facility as non-hazardous waste and soils remaining at the site meet the FRG cleanup level for cPAH and PCB.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of remedy selection still valid?

There has been a change in the toxicity parameters used to evaluate the risk at SWMUs 7, 23, 35 and 40; however, the changes do not indicate that the remedies are no longer protective.

Changes in standards, newly promulgated standards, and TBC

The selected remedy for SWMUs 7, 35, and 40 was driven by the State Cleanup Action and Risk Based Closure Standards (UAC R315-101). The risk to industrial workers or construction workers, the reasonable future use receptors, is at an acceptable level; but there is a risk greater than 10^{-6} to a hypothetical resident. The Utah Risk Rule requires a site management plan when the risk is less than 10^{-4} but greater than 10^{-6} to a hypothetical resident and this requirement has not changed. There are no new relevant standards.

SWMU 23 required an active remedy to address PCB and cPAH contaminated soil. Cleanup criteria for cPAH were risk based, and no standards have been changed or added that would alter the cleanup criteria. The cleanup level for PCB was based on the Toxic Substances Control Act, which has not changed.

Changes in exposure pathways

There has been no change in exposure pathways, as all four SWMUs remain in industrial use only. The physical condition of the sites has not significantly changed and soils have not been moved/reworked at these sites.

Changes in toxicity

2,4-DNT and RDX were identified as COCs at SWMU 40. For SWMU 23 PCB and cPAHs were identified as COCs. Chlordane was identified as a COC at SWMU 35. Beryllium was identified as a COC at SWMU 7.

Since the issuance of the ROD at SWMU 40, the oral SF has decreased for 2,4-DNT, indicating a lower risk for ingestion, and an IUR has been established for 2,4-DNT, which would result in a higher risk because no inhalation risk was computed for 2,4-DNT during the RI/FS. A

comparison was made with the 2,4-DNT FRG for the site and the current EPA industrial soil RSL. The 2,4-DNT FRG of 4.7 mg/kg is less than the industrial soil RSL of 5.5 mg/kg, which indicates an acceptable level of risk, and the remedial goal remains protective of human health.

At SWMU 35 an inhalation RfC has been established for chlordane since the issuance of the ROD. The current industrial soil RSL for non-cancer hazard for chlordane is 450 mg/kg, while the exposure point concentration for chlordane at SWMU 35 is 20 mg/kg, well below the RSL, which indicates the remedy at SWMU 35 remains protective of human health.

At SWMU 23 IUR values have been established for cPAHs since the issuance of the ROD. A comparison of the FRG cleanup levels with the current risk based industrial soil RSL for the detected cPAHs shows that the RSLs are slightly less than the FRG, and that the confirmation samples collected at the time of the remedial action demonstrated that site cPAH levels are below both the remedial goals, and the RSLs. A new IUR was also established for PCB; however, the cleanup levels for PCB are established by the Toxic Substances Control Act, and this level has not changed. Institutional controls are in place at SWMU 23 to address cPAH and PCB concentrations above those that would allow UU/UE.

At SWMU 7, the RfD for beryllium has decreased, which would result in a higher non-cancer hazard than that estimated at the time of the ROD. Although the statistically based site Exposure Point Concentration (EPC) is within background levels and below the final remedial goal (FRG), the exposure risk and hazard based on the reasonable maximum exposure (RME) determined that beryllium posed unacceptable risk to a hypothetical residential receptor. Therefore, in accordance with the Utah risk rule, the ROD implemented Land Use Controls and the change in the RfD for beryllium does not affect the protectiveness of the remedy.

Changes in risk assessment methods

No standardized risk assessment methods have changed for PAHs that could affect the protectiveness of the remedy.

Identification of New Contaminants

Chromium has been sampled as total chromium at TEAD and was not identified as a contaminant of potential concern (COPC) at SWMUs 7 and 40 during the RI/FS, and was not included in the risk assessment. EPA no longer establishes screening values for total chromium, and the exposure point concentration (EPC) for total chromium at SWMUs 7 and 40 exceeds the background levels for total chromium and the current RSL for chromium (VI) (the more toxic form of chromium). This indicates that chromium exceeds the current COPC screening criteria, and should possibly be included in the risk assessment for the sites. However, chromium was included in the risk assessments at SWMUs 6 and 8, which had EPCs higher than SWMUs 7 and 40, and was not found to present an unacceptable risk. This could indicate an acceptable level of risk due to chromium at SWMUs 7 and 40.

Question C: Has any other information come to light that could call into question the protectiveness of the remedies?

No additional information has come to light that would call into Question the protectiveness of the remedy.

VIII. Issues

OU	Issue	Affects Protectiveness? (Y/N)	
		Current	Future
4, 8	No warning sign was observed at SWMU 31. Warning signs at SWMU 6 were extremely faded and unreadable.	N	Y
8	Fence surrounding SWMU 6 is damaged at the entrance which does not allow for the gate to be locked.	N	Y
9	The text of the warning sign is not visible to personnel approaching SWMU 7.	N	Y
9	The front gate of SWMU 40 was found open and unlocked. The gate could not be closed and locked due to overgrown vegetation in front of the gate.	N	Y

IX. Recommendations and Follow-up Actions

OU	Recommendation	Party Responsible	Oversight Agency	Milestone
4, 8	Replace the warning signs at SWMUs 31 and 6.	TEAD	EPA	
8	Repair damaged fencing.	TEAD	EPA	
9	Change the direction of warning sign at SWMU 7 to allow visibility to personnel.	TEAD	EPA	
9	Clear vegetation in front of gate to allow for closure.	TEAD	EPA	

Additional items have been identified which do not affect the protectiveness of the remedy but are sufficiently significant that a recommended action is given. The following table includes a description of the items identified and recommendations for addressing the items. No milestone data is given for action on these recommendations.

Recommendations on Items Not Affecting Protectiveness

OU	Recommendation	Party Responsible	Oversight Agency

5	The Master RDIC Map and the LUC Map still shows SWMU 17 as a site with LUC restrictions. The maps should be updated to remove SWMU 17.	TEAD	EPA
8	The risk at SWMU 13 was due to chloromethane detected at the site. EPA no longer recognizes a cancer Slope Factor or IUR for chloromethane, and therefore there would be no increased lifetime cancer risk at SWMU 13 due to chloromethane. Additionally, given the conceptual site model, chloromethane is unlikely to be released at the site and if it was, it is unlikely to persist long term in the soil. Based on this information, the laboratory data should be re-examined and if necessary, resampling should take place to confirm that LUCs are still needed. If the risk is found to be acceptable for residential use, TEAD should coordinate with EPA to determine whether continued institutional controls restricting residential use and five-year reviews are needed at the site.	TEAD	EPA
8, 9	SWMUs 13 and 35 warning signs were not visible when approached as they were not attached to the post. Attach warning signs to post.	TEAD	EPA

X. Protectiveness Statement(s)

Operable Unit 4

This operable unit includes SWMU 31

The remedy for OU 4 currently protects human health and the environment because exposure pathways that could result in unacceptable risks are being addressed through institutional controls. However, in order to be protective in the long term the warning sign at SWMU 31 should be replaced.

Operable Unit 7

This operable unit includes SWMU 5

The remedy for OU 7 is protective of human health and the environment. Exposure pathways that could result in unacceptable risks are being controlled with institutional controls.

Operable Unit 8

This operable unit includes SWMUs 6, 8, 13, 22, and 36

The remedy for OU 8 currently protects human health and the environment because exposure pathways to soils by depot and construction workers at SWMU 8 have been eliminated

by the removal and treatment of the lead contaminated soil. The treated soil was placed in a CAMU. All remaining exposure pathways that could result in unacceptable risks at OU 9 SWMUs are being controlled through institutional controls. However, in order for the remedy to be protective in the long term the warning sign at SWMU 6 should be replaced and the fence should be repaired.

Operable Unit 9

This operable unit includes SWMUs 7, 23, 35, and 40

The remedy for OU 9 currently protects human health and the environment because exposure pathways to soils by depot and construction workers at SWMU 23 have been eliminated by removal and disposal of the PCB and cPAH contaminated soil. All remaining exposure pathways that could result in unacceptable risks at OU 9 SWMUs are being controlled through institutional controls. However, in order to be protective in the long-term vegetation should be removed from in front of the gate to allow for it to be locked at SWMU 40 and the direction of the warning sign at SWMU 7 should be changed to allow visibility to personnel approaching the SWMU.

XI. Next Review

The next review will be due on March 28, 2023.

Tables

Table 1 Federal Facilities Agreement (FFA) Operable Units				
Operable Unit	**SWMU**	**MRS**	**ROD/ESD Date**	**Description**
1				Not Assigned in FFA- See Note Below this Table
2				Not Assigned in FFA- See Note Below this Table
3				Not Assigned in FFA- See Note Below this Table
4	31		ROD January 2003	Former Transformer Boxing Area
	32		ROD January 2003	PCB Spill Site
5	17		ROD September 1994	Former Transformer Storage Area
	33		ROD September 1994	PCB Spill Site
6	9		ROD September 1994	Drummed Radioactive Waste Area
	18		ROD September 1994	Radioactive Waste Storage Building
7	5		ROD September 1994	Pole Transfer PCB Spill
8	6		ROD March 2004 ESD March 2010	Old Burn Area
	8		ROD March 2004	Small Arms Firing Range
	13		ROD March 2004	Tire Disposal Area
	22		ROD March 2004	Building 1303 Washout Pond
	36		ROD March 2004	Old Burn Staging Area
9	7		ROD September 2008	Chemical Range
	23		ROD September 2008	Bomb and Shell Reconditioning Building
	35		ROD September 2008	Wastewater Spreading Area
	40		ROD September 2008	AED Test Range
10	41		ROD September 1994 ESD November 1995	Box Elder Wash Drum Site
11				Not Assigned in FFA- See Note Below this Table
12				Not Assigned in FFA- See Note Below this Table
13				Not Assigned in FFA- See Note Below this Table
14				Not Assigned in FFA- See Note Below this Table
15		TEAD-001-R-01		(OB/OD) Area
		TEAD-007-R-01	Pending ROD	On-Post Chemical Range

		TEAD-005-R-01	Pending ROD	Building 539 Disposal Area
		TEAD-006-R-01		Old Burn Staging Area
		TEAD-004-R-01		Old Burn Area
		TEAD-008-R-01		Explosive Ordinance Detachment Training Area
		TEAD-002-R-01		Northeast Demil Area
16		TEAD-003-R-01	ROD October 2013	Chemical Range (Off-Post)

Note: OU 1 through OU 3 and OU 11 through OU 14 were not officially designated in the FFA; however, for record keeping and tracking purposes in SEMS, OU 1, 2, 3, 11, 12, 13, 14 are used for RCRA Corrective Actions.

Table 2 Site Chronology	
Date	**Event**
Dec 1979	Environmental Assessment of Tooele Army Depot (USATHAMA)
Jun 1982	Installation Environmental Assessment (IPEC)
1982	Exploratory Environmental Contamination Assessment (ERTEC)
1982	Environmental Photographic Interpretation (EPA)
1982-1985	Investigation of the Open Burning/Open Detonation Area (AEHA)
May 1983	Analysis of Existing Facilities/Environmental Assessment (TEAD)
Jan 1985	Monitoring Activity and Waste Disposal Review and Evaluation (CH2MH)
Mar 1985	Environmental Balance Study (DA)
Mar 1985	Performance Evaluation of Remedial Response Activities at Uncontrolled Hazardous Waste Sites (CMD)
1985	Interim Groundwater Quality Assessment (WC)
Nov 1985	Analytical/Environmental Assessment (TEAD)
Jan 1986	IWL -Groundwater Quality Assessment, Corrective Action Plan, and Record of Decision (JMM)
Mar 1986	Engineering Report for Closure of the IWL (JMM)
Jul 1986	Addendum to Environmental Photographic Interpretation (EPA)
May 1988	Groundwater Quality Assessment Engineering Report (JMM)
Dec 1988	Preliminary Assessment/Site Investigation (EA/EST)
Dec 1989	Discharges to the IWL stopped and the lagoon closed.
Aug 1990	Site placed on the National Priorities List (NFL)
Dec 1990	Remedial Investigation (RFW)
Jan 1991	RCRA Corrective Action Permit issued
Feb 1991	Groundwater Duality Assessment (ESE)
Sep 1991	Federal Facilities Agreement
Apr 1992	Preliminary Baseline Risk Assessment (SECD)
Feb 1994	Remedial Investigation for Operable Units 4-10 (RUST)
Mar 1994	Feasibility Study for OUs 5, 6, 7, and 10 (RUST)
Sep 1994	Record of Decision for Operable Units 5,6,7, and 10 (RUST)
Nov 1995	Remedial Design for SWMUs 5 and 41 (JACOBS)
May 1996	Site Close-out Report for SWMUs 5 and 41 (USACE)
Nov 1996	Phase II Remedial Investigation for OUs 4, 8, and 9 (RUST)
Dec 1999	Feasibility Study for OUs 4 and 8 (DM)
Dec 1999	Proposed Plan for OUs 4 and 8 (DM)
Sep 2000	Record of Decision for OUs 4 and 8 (DM)
Sep 2002	First Five-Year Review Completed
Jan 2003	Record of Decision OU 4
Mar 2004	Record of Decision OU 8
Dec 2004	Construction Complete SWMU 8 in OU 8
Jun 2007	Proposed Plan for OU 9
Mar 2008	Second Five-Year Review Completed
Sep 2008	Record of Decision OU 9
Oct 2008	Construction Complete OU 9 SWMU 23
Mar 2010	Explanation of Significant Differences OU 8 SWMU 6
May 2010	Construction Complete OU 8 SWMU 6
March 2013	Third Five-Year Review Completed
Oct 2013	Record of Decision OU 16

Table 3 Closed CERCLA Operable Unit Sites					
SWMU	MRS	Description	Operable Unit (CERCLA)	Selected Remedy	Site Status
17		Former Transformer Storage Area	5	No Action	NA-UU/UE
32	-	PCB Spill Site	4	No Further Remedial Action Planned	NFA-UU/UE
33	-	PCB Storage Building	5	No Further Remedial Action Planned (Under CERCLA). Deferred to TSCA.	NFA-Closure under TSCA is believed to have occurred in 1997.
9	-	Drummed Radioactive Waste Area	6	No Further Remedial Action Planned	NFA-UU/UE
18	-	Radioactive Waste Storage Building	6	No Further Remedial Action Planned (Under CERCLA). Deferred to TSCA.	NFA-Closure under NRC.
41	-	Box Elder Wash Drum Site	10	Remove drums and stained soil, characterize waste materials, and incinerate drums materials. No additional actions required after removal.	NFA-UU/UE
-	TEAD-003-R-01	Chemical Range (Off-Post)	16	No Remedial Action Planned	NA

Notes: Documentation of the closure for SMWU 18 under NRC authority and SWMU 33 under TSCA authority was not found during this review. This closure status is from the second Five-Year Review.

UU/UE- Unlimited Use and Unlimited exposure
NFA – No Further Action
NA – No Action

Table 4 Remedy Selection for CERCLA Operable Unit Sites				
SWMU	**Description**	**Operable Unit (CERCLA)**	**Selected Remedy**	**Basis for Selection**
31	Former Transformer Boxing Area	4	Institutional controls	Risk to future residents due to polycyclic aromatic hydrocarbons (PAHs). No unacceptable risk to industrial workers. No risk of a magnitude to require active remediation.
5	Pole Transformer PCB Spill	7	Backfill existing excavation, cap with soil and gravel layers. Institutional controls (as recommended in the first 5-year review).	Protection of public health and the environment from exposure to contamination by PCBs. In addition, the selected remedy is intended to protect cattle and wildlife from exposure to contaminated soil. In the first Five-Year Review it was found that the SWMU did not meet the requirements for risk based closure under Utah Administrative Code (UAC) 315-101 (the Risk Rule), as the risk exceeded 1x10-6 on a residential basis. Institutional controls were added to the remedy after the first review.
6	Old Burn Area	8	Excavation and offsite disposal of lead and explosive contaminated soil. Institutional controls.	Risks to future construction workers and future residents due to Lead and 2,4-Dinitrotoluene (2,4-DNT).
8	Small Arms Firing Range	8	Excavation and stabilization and placement of lead contaminated soil in a CAMU. Institutional controls.	Elevated predicted blood lead levels and potential adverse ecological effects required active remediation. Residual risks to hypothetical residents at the SWMU require institutional controls.
13	Tire Disposal Area	8	Institutional controls	Risk to future residents due to chloromethane. No unacceptable risk to Depot workers. No risk of a magnitude to require active remediation. EPA no longer recognizes a cancer Slope Factor or IUR for chloromethane, and therefore there would be no

				increased lifetime cancer risk at SWMU 13 due to chloromethane. Based on this information, the risk assessment for SWMU 13 should be re-evaluated. If the risk is found to be acceptable for residential use, TEAD should coordinate with EPA to determine whether continued institutional controls restricting residential use and five-year reviews are needed at the site.
22	Building 1303 Washout Pond	8	Institutional controls	Risk to future residents due to trinitrotoluene (TNT) and cyclotrimethylenetrinitramine (RDX). No unacceptable risk to Depot workers. No risk of a magnitude to require further active remediation.
36	Old Burn Staging Area	8	Institutional controls	No carcinogenic COPCs at the SWMU. No unacceptable hazard to Depot workers. HI greater than 1.0 for hypothetical residents, with the main contributor being copper.
7	Chemical Range	9	Institutional controls	Risk to future residents due to metals, particularly beryllium. No unacceptable risk to Depot workers. No risk of a magnitude to require active remediation.
23	Bomb and Shell Reconditioning Building	9	Excavation and off-post disposal. Institutional controls	PCB and PAHs are contaminants of concern (COCs). Active remediation required due to PCB above allowable levels under TSCA.
35	Wastewater Spreading Area	9	Institutional controls	Risk to future residents due to DBHC and Chlordane. No unacceptable risk to Depot workers. No risk of a magnitude to require active remediation.
40	AED Test Range	9	Institutional controls	Risk to future residents due to RDX and 2,4-DNT. No unacceptable risk to Depot workers. No risk of a magnitude to require active remediation.

Note: A complete list of the institutional controls at each site is given in Table 7.

Table 5 Site Inspection Summary				
SWMU	**Description**	**Operable Unit**	**ROD Selected Remedy**	**Site Condition**
31	Former Transformer Boxing Area	4	Institutional controls	SWMU 31 is in industrial use in an industrial area. The site is in the BRAC area. The site is being used to store materials used in metal fabrication. There was no evidence that soils have been removed from the site. A warning sign was not observed at the site.
5	Pole Transformer PCB Spill	7	Backfill the excavated low area, cap with soil and gravel layers. Institutional controls (as recommended in the first 5-year review).	SWMU 5 is a vacant gravel, sage and grass covered area beneath a power line, adjacent to railroad tracks and a road. The surrounding area is vacant except for the railroad and the road. The area along the railroad is used for ammunition storage. The gravel and soil cover was in good condition. A warning sign was observed at the site.
6	Old Burn Area	8	Excavation and offsite disposal of lead and explosive contaminated soil. Institutional controls.	SWMU 6 is a vacant fenced area, and the surrounding area is vacant. Only one warning sign at the entrance is visible, all other warning signs surrounding the fence are extremely faded. Walked the perimeter of the fence and saw no evidence of it being breeched; however, the fence is damaged at the entrance which does not allow for the gate to be locked.
8	Small Arms Firing Range	8	Excavation and stabilization of lead contaminated soil. Institutional controls.	SWMU 8 is a vacant area located in a restricted fence area. There was no evidence the site has been disturbed. A warning sign was observed at the site.
13	Tire Disposal Area	8	Institutional controls	SWMU 13 is a gravel pit that formally served as a tire disposal area. The tires have been removed and the gravel pit is now empty. The surrounding area is vacant. A warning sign was present at the site but was not affixed to the post. The warning sign was located next to the post on the ground.
22	Building 1303 Washout Pond	8	Institutional controls	SWMU 22 is a vacant sage covered low area adjacent to a concrete road. The buildings associated with the pond have been removed. The surrounding area is vacant. A warning sign was observed at the site.

36	Old Burn Staging Area	8	Institutional controls	SWMU 36 is a small pit that was used as a temporary staging area for materials that were to be disposed of or burned in the adjacent Old Burn Area. The site is now vacant. A warning sign was observed at the site. As part of the MMRP, this site was required to be fenced in to stop cattle from grazing. A warning sign was observed at the site.
7	Chemical Range	9	Institutional controls	SWMU 7 is a vacant area along the southern edge of the depot boundary. The surrounding area is vacant. A warning sign was observed at the site but it is not facing the direction of approach to the site. Sign should face outwards to effectively warn personnel.
23	Bomb and Shell Reconditioning Building	9	Excavation and off-post disposal. Institutional controls	SWMU 23 has about a 2.25 foot deep excavation of the former location of contaminated soils along the road near building 1345. No physical boundaries of the site are visible. This area is in industrial use. A warning sign was observed at the site.
35	Wastewater Spreading Area	9	Institutional controls	SWMU 35 is a vacant grass and sage covered area with ditches and a field where wastewater was discharged. The surrounding area is vacant except for the railroad along the eastern edge of the site. A warning sign was present at the site but was found lying on the ground next to the post.
40	AED Test Range	9	Institutional controls	SWMU 40 is an explosives test area. The front gate was found open and unlocked. The gate could not be closed and locked when we departed due to overgrown bushes in front of the gate blocking it from closing. Bushes should be trimmed back to allow for gate to close.

Table 6
Contaminants of Concern & Final Remedial Goals

OU	SWMU	ROD Specified Contaminant of Concern	ROD Specified FRG (mg/kg)
4	31	None	-
7	5	None	-
8	6	2,4-Dinitrotoluene	4.7
		Lead	1,800
	8	Lead	1,800
	13	None	-
	22	None	-
	36	Lead	1,800
9	7	Beryllium	1.5
	23	Benzo(a)anthracene	2.1
		Benzo(a)pyrene	0.21
		Benzo(b)fluoranthene	2.1
		Dibenz(a,h)anthracene	0.21
		Total PCBs	25[a]
	35	Chlordane	6.6
		DBHC	1.8
	40	2,4-Dinitrotoluene	4.7
		RDX	31

a – The FRG is based on the Toxic Substances Control Act, "PCB Spill Cleanup Policy" (40 CFR 761, Subpart G).

Table 7 Institutional Controls					
SWMU	**OU**	**ROD Specified ICs**	**IC Implementation Documents**	**RDIC Land Use Control Restrictions**	**RDIC Land Use Control Mechanisms [b]**
31	4	The land use restrictions [a] set forth in the deed CCRs are to be included in the site management plans. The CCR land use restrictions are summarized as: 1. Residential use is allowed. 2. No disturbance of environmental remediation systems allowed, or digging or disturbance of the soil or subsurface. 3. No alterations or improvements to the property without approval of the Army. 4. New building locations in the area are to be coordinated with the Army.	Deed Restrictions contained in CCRs recorded in the Records of the County Recorder Office, Tooele County, Utah of January 6, 1999 Remedial Design Plan for Institutional Controls Operable Unit 4, Site 31. February 2005	1. No residential use of the property 2. No off-site transportation of soils	1. The deed restrictions set forth in the RDIC are included in the Real Estate Deed and associated Covenants, Conditions and Restrictions (CCR) for Economic Development Conveyance for Tooele Army Depot's BRAC parcel, recorded in the Tooele County Recorder Office January 6, 1999. 2. Annual inspection to include site warning signs. 3. Five-year reviews
5	7	None specified in the ROD. ICs were implemented in the RDIC at the recommendation of the first five-year review.	TEAD Installation Master Plan Remedial Design Plan for Institutional Controls Operable Unit 7, Site 5. February 2005	1. No residential use of the property 2. No off-site transportation of soils	1. Site Warning Signs 2. Include the site on an installation wide LUC Site Map as part of the TEAD Installation Master Plan 3. Annual Inspection 4. Five-Year Reviews
6	8	1. Prevent residential use of the SWMU. 2. Prevent offsite transportation of the soil from the SWMU.	TEAD Installation Master Plan Remedial Design Plan for Institutional Controls Operable Unit 8. December 2003	1. No residential use of the property 2. No off-site transportation of soils	1. Site Warning Signs 2. Include the site on an installation wide LUC Site Map as part of the TEAD Installation Master Plan 3. Annual Inspection 4. Five-Year Reviews

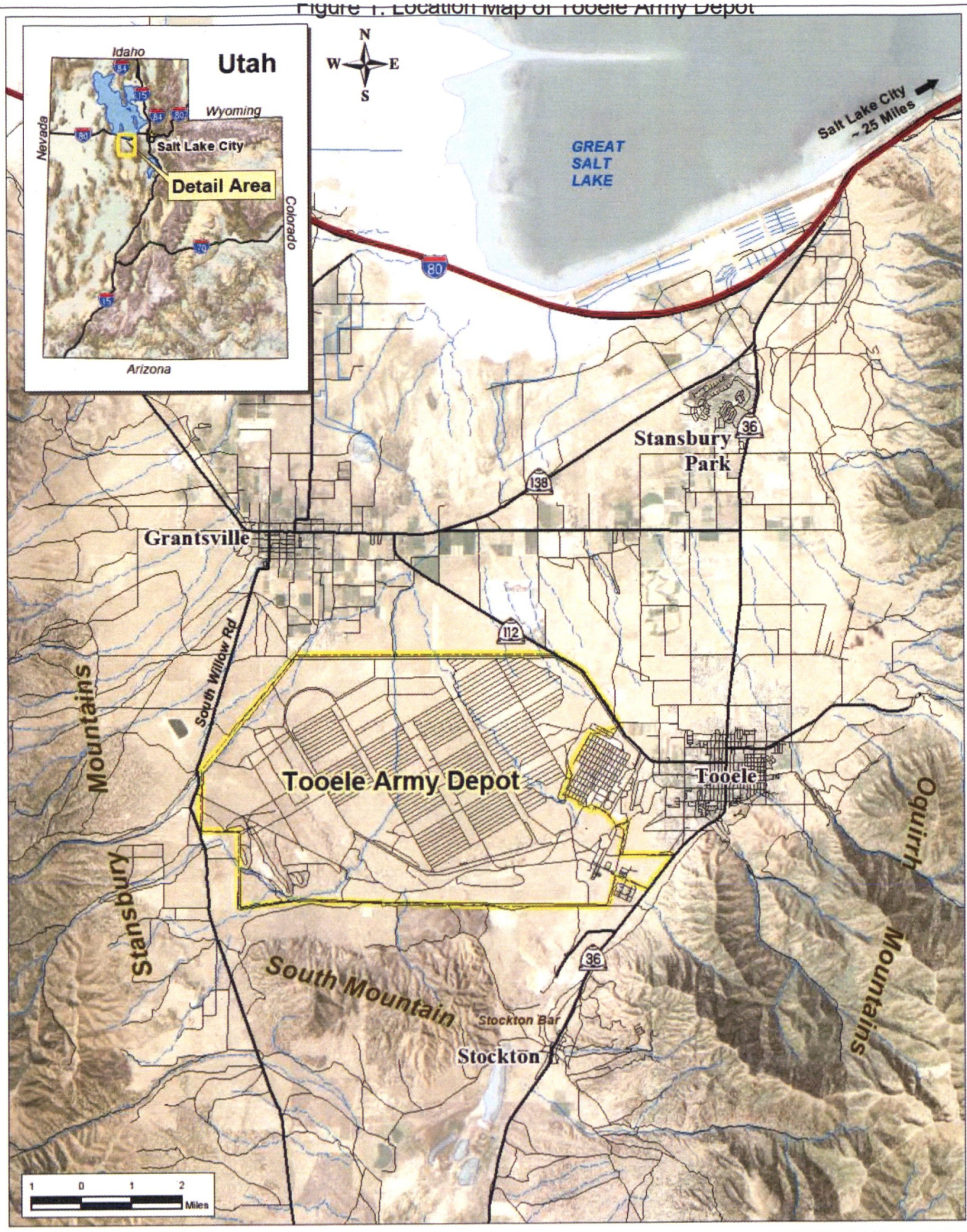
8	8	1. Prevent residential use of the SWMU. 2. Prevent offsite transportation of the soil from the SWMU.	TEAD Installation Master Plan Remedial Design Plan for Institutional Controls Operable Unit 8. December 2003	1. No residential use of the property 2. No off-site transportation of soils	1. Site Warning Signs 2. Include the site on an installation wide LUC Site Map as part of the TEAD Installation Master Plan 3. Annual Inspection 4. Five-Year Reviews
13	8	1. Prevent residential use of the SWMU. 2. Prevent offsite transportation of the soil from the SWMU.	TEAD Installation Master Plan Remedial Design Plan for Institutional Controls Operable Unit 8. December 2003	1. No residential use of the property 2. No off-site transportation of soils	1. Site Warning Signs 2. Include the site on an installation wide LUC Site Map as part of the TEAD Installation Master Plan 3. Annual Inspection 4. Five-Year Reviews
22	8	1. Prevent residential use of the SWMU. 2. Prevent offsite transportation of the soil from the SWMU.	TEAD Installation Master Plan Remedial Design Plan for Institutional Controls Operable Unit 8. December 2003	1. No residential use of the property 2. No off-site transportation of soils	1. Site Warning Signs 2. Include the site on an installation wide LUC Site Map as part of the TEAD Installation Master Plan 3. Annual Inspection 4. Five-Year Reviews
36	8	1. Prevent residential use of the SWMU. 2. Prevent offsite transportation of the soil from the SWMU.	TEAD Installation Master Plan Remedial Design Plan for Institutional Controls Operable Unit 8. December 2003	1. No residential use of the property 2. No off-site transportation of soils	1. Site Warning Signs 2. Include the site on an installation wide LUC Site Map as part of the TEAD Installation Master Plan 3. Annual Inspection 4. Five-Year Reviews
7	9	1. Prevent residential use by prohibiting the development and use of property for residential housing, elementary and secondary schools, child care facilities and playgrounds. 2. Prevent transfer of soils to a residential area by preventing excavation, except in accordance with	TEAD Installation Master Plan Remedial Design Plan for Institutional Controls Operable Unit 9. September 2008	1. No residential use of the property 2. No excavation and transfer of soil	1. Site Warning Signs 2. Include the site on an installation wide LUC Site Map as part of the TEAD Installation Master Plan 3. Annual Inspection 4. Five-Year Reviews

		an approved plan that includes provision for proper disposal of any soil.			
23	9	1. Prevent residential use by prohibiting the development and use of property for residential housing, elementary and secondary schools, child care facilities and playgrounds. 2. Prevent transfer of soils to a residential area by preventing excavation, except in accordance with an approved plan that includes provision for proper disposal of any soil.	TEAD Installation Master Plan Remedial Design Plan for Institutional Controls Operable Unit 9. September 2008	1. No residential use of the property 2. No excavation and transfer of soil	1. Site Warning Signs 2. Include the site on an installation wide LUC Site Map as part of the TEAD Installation Master Plan 3. Annual Inspection 4. Five-Year Reviews
35	9	TEAD Installation Master Plan Remedial Design Plan for Institutional Controls Operable Unit 9. September 2008	1. No residential use of the property 2. No excavation and transfer of soil 3. Depot worker access restrictions	1. No residential use of the property 2. No excavation and transfer of soil 3. Depot worker access restrictions	1. Site Warning Signs 2. Include the site on an installation wide LUC Site Map as part of the TEAD Installation Master Plan 3. Annual Inspection 4. Five-Year Reviews
40	9	1. Prevent residential use by prohibiting the development and use of property for residential housing, elementary and secondary schools, child care facilities and playgrounds. 2. Prevent transfer of soils to a residential area by preventing excavation, except in accordance with an approved plan that includes provision for proper disposal of any soil. 3. Prevent long term exposure to the Depot worker by limiting the amount of time a worker can be on the site.	TEAD Installation Master Plan Remedial Design Plan for Institutional Controls Operable Unit 9. September 2008	1. No residential use of the property 2. No excavation and transfer of soil 3. Depot worker access restrictions	1. Site Warning Signs 2. Include the site on an installation wide LUC Site Map as part of the TEAD Installation Master Plan 3. Annual Inspection 4. Five-Year Reviews 5. Any construction activities conducted at SWMU 40 will require UXO support to ensure the safety of the construction workers. In addition, prior

					to any construction on SWMU 40, the chemical risks associated with site soil contamination will be evaluated with appropriate personnel protective equipment requirements being identified.

Notes:
a -The CCRs also included groundwater use restrictions at SWMU 31, but these are not included in the site ROIC Land Use Control Restrictions.
b -In addition to the Land Use Control Mechanisms, the RDICs describe Reporting and Notification requirements for all OUs. The RDICs for OUs 7, 8 and 9 also include Protective Measures that have or will be implemented to limit the potential for LUC objective violations. These Protective Measures include: (1) Perimeter fencing/patrols, (2) Army Regulation 210-20, which defines the master planning process establishing requirements, policies, procedures, and responsibilities for the development, approval, update and implementation of the installation's master plan. This regulation also establishes a relationship between environmental planning and real property planning to ensure that environmental consequences of planning decisions are addressed. An objective of master planning is to identity actions that may result in adverse environmental impacts or consequences. In identifying these actions. The master planning process requires environmental analysis to ensure compliance with state and federal law.
IC -Institutional Control
RDIC -Remedial Design Plan for Institutional Controls

Figure 1. Location Map of Tooele Army Depot

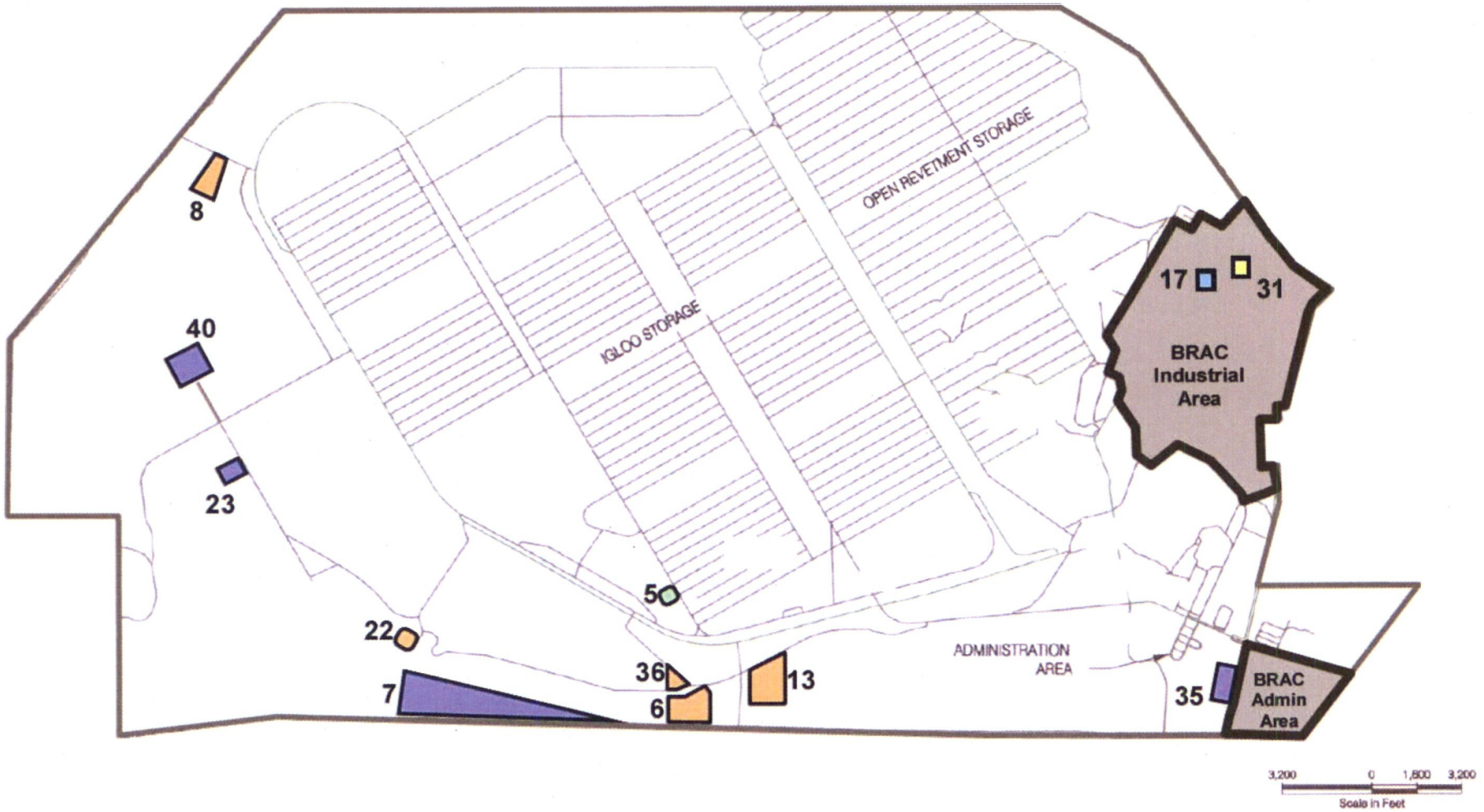


LOCATION MAP OF TOOELE ARMY DEPOT AND VICINITY	
Figure: 1	Date: 08/08/07
Tooele Army Depot, Utah	

URS

Figures

Figure 1 - Tooele Army Depot
Operable Units 4, 5, 7, 8 and 9



Operable Unit 4
- SWMU 31 – Former Transformer Boxing Area

Operable Unit 5
- SWMU 17 – Former Transformer Storage Area

Operable Unit 7
- SWMU 05 – Pole Transformer PCB Spill

Operable Unit 8
- SWMU 06 – Old Burn Area[1]
- SWMU 08 – Small Arms Firing Range
- SWMU 13 – Tire Disposal Area
- SWMU 22 – Building 1303 Washout Pond
- SWMU 36 – Old Burn Area[1]

Operable Unit 9
- SWMU 7 – Chemical Range[2]
- SWMU 23 – Bomb and Shell Reconditioning Facility
- SWMU 35 – Wastewater Spreading Area
- SWMU 40 – AED Demil Test Site

1 - SWMU 6 and SWMU 36 are associated with OU 8 and OU 15.

2 - SWMU 7 is associated with OU 9 and OU 16.

Figure 2. Site Location Map

Figure 3. MRS Location Map

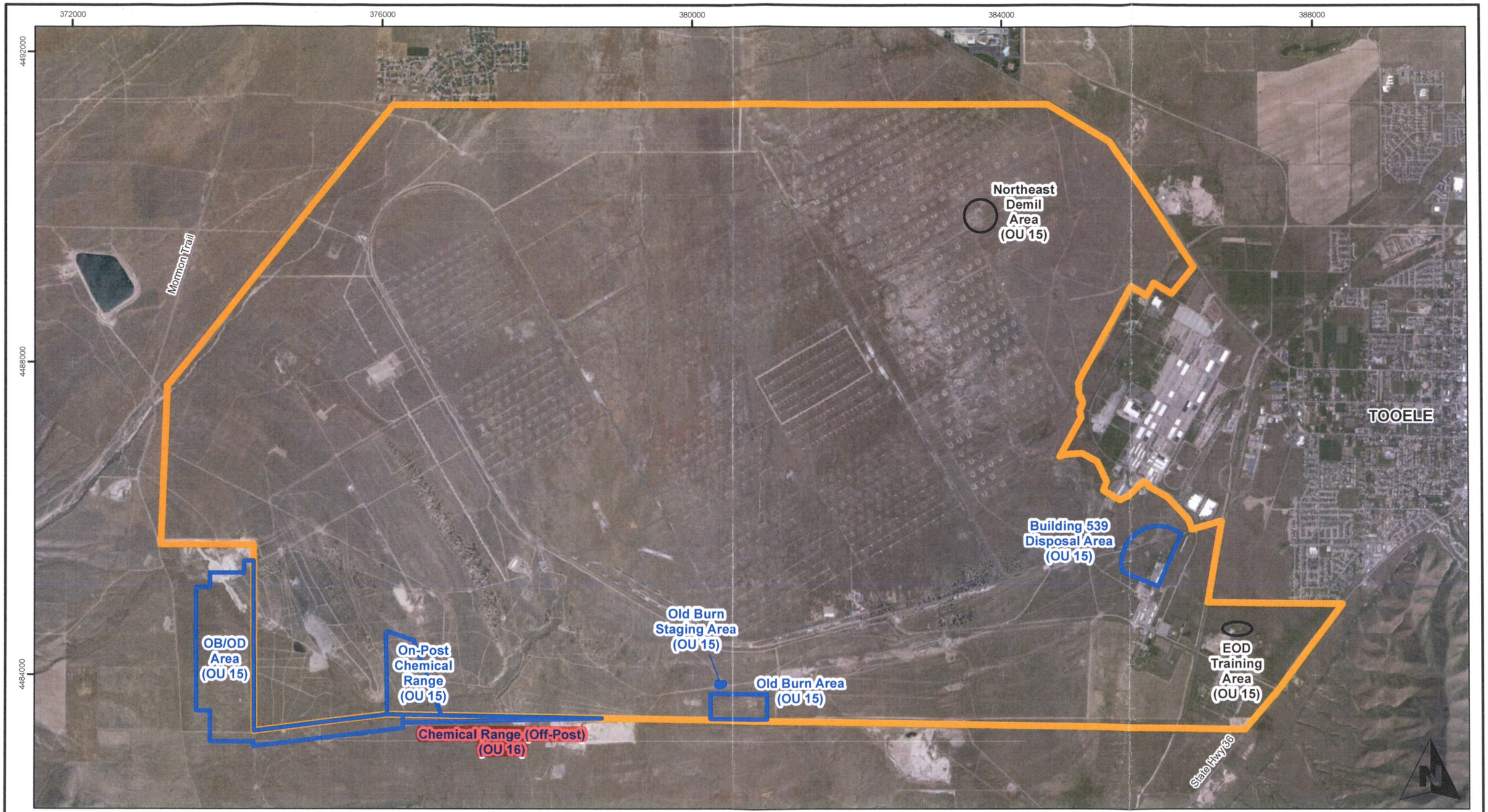


FIGURE 2.2 - Tooele Army Depot Munitions Response Sites - Operable Units 15 and 16

Legend

- MRS Boundary
- Installation Boundary
- MRS Requiring No Action

Image Source: ESRI, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Gemapping, Aerogrid, IGN, IGP and the GIS User Community

Miles 0 0.25 0.5 0.75

Kilometers 0 0.5 1

Date:	9/4/2013
Designed:	RGS
Drawn:	RGS
Checked:	JY
Approved:	DS

PARSONS

Projection & Grid Coorindates: WGS84, UTM, Zone 12, Meters

X:\GISCADD\projects\TEAD_MMRP\mapfiles\ROD_OffPost_Chem_Range\MRSs.mxd

Figure 8. OU 16 Site Map

FIGURE 2.3 - Chemical Range (Off-Post)

Legend

Chemical Range (Off-Post)

Image Source: ESRI, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Gemapping, Aerogrid, IGN, IGP and the GIS User Community

Feet 0	325	650
Meters 0	100	200

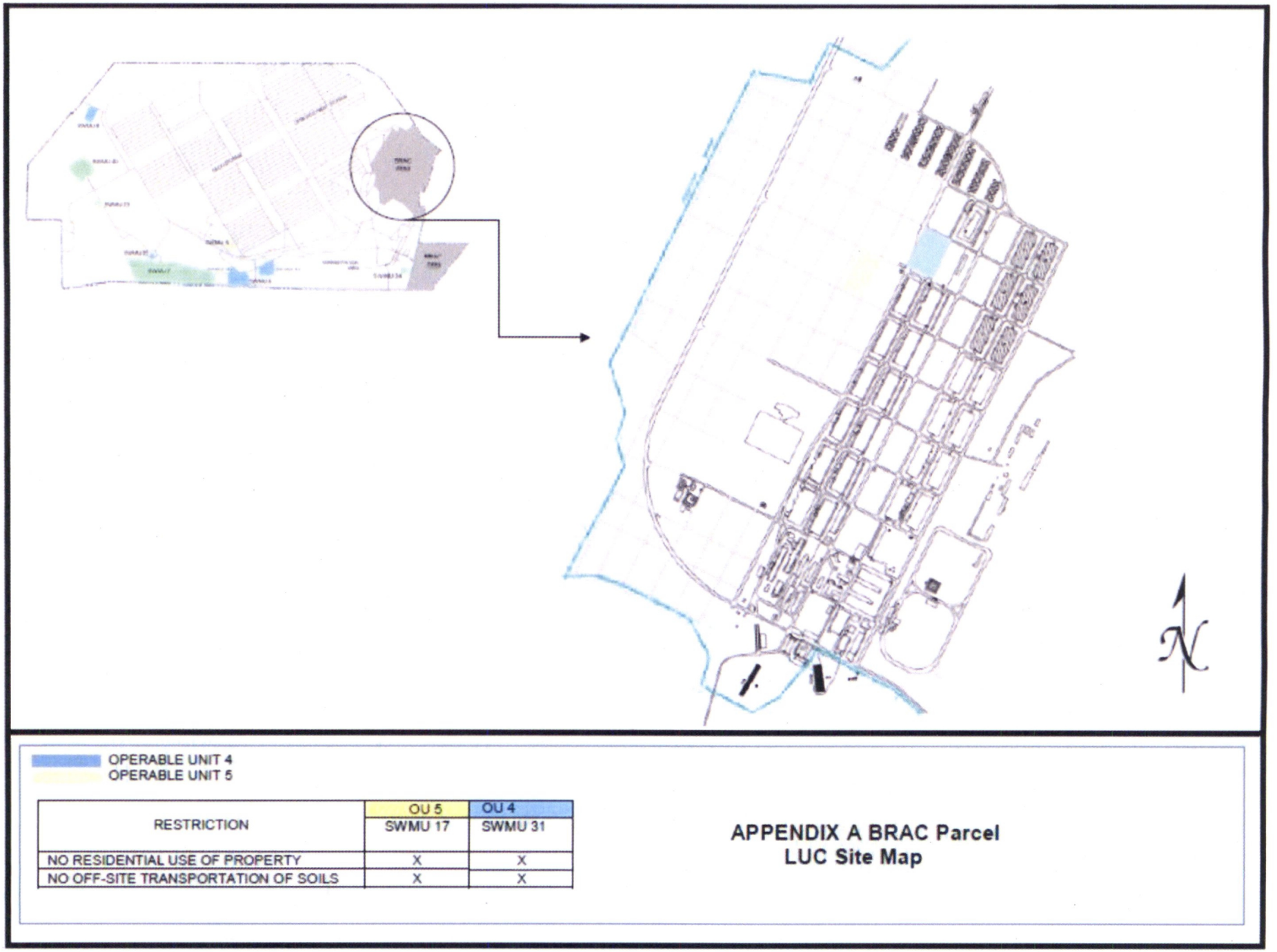
Date:	9/4/2013
Designed:	RGS
Drawn:	RGS
Checked:	JY
Approved:	DS

PARSONS

Projection & Grid Coorindates: WGS84, UTM, Zone 12, Meters

X:\GISCADD\projects\TEAD_MMRP\mapfiles\ROD_OffPost_Chem_Range\ChemRange_MEC_Inv.mxd

Figure 4. OU 4 and OU 5 LUC Map



RESTRICTION	OU 5 SWMU 17	OU 4 SWMU 31
NO RESIDENTIAL USE OF PROPERTY	X	X
NO OFF-SITE TRANSPORTATION OF SOILS	X	X

APPENDIX A BRAC Parcel
LUC Site Map

Figure 5. OU 7 LUC Map

OPERABLE UNIT 7

RESTRICTION	OU 7 Site 5
NO RESIDENTIAL USE OF PROPERTY	X
NO OFF-SITE TRANSPORTATION OF SOILS	X

APPENDIX A

LUC Site Map

Figure 6. OU 8 LUC Map

OPERABLE UNIT 8

RESTRICTION	OU 8				
	SWMU 6	SWMU 8	SWMU 13	SWMU 22	SWMU 36
NO RESIDENTIAL USE OF PROPERTY	X	X	X	X	X
NO OFF-SITE TRANSPORTATION OF SOILS	X	X	X	X	X

APPENDIX A
LUC Site Map

Figure 7. OU 9 LUC Map

OPERABLE UNIT 9

RESTRICTION	OU 9			
	SWMU 7	SWMU 23	SWMU 35	SWMU 40
NO RESIDENTIAL USE OF PROPERTY	X	X	X	X
NO EXCAVATION AND TRANSFER OF SOIL	X	X	X	X
DEPOT WORKER ACCESS RESTRICTIONS			X	X

APPENDIX A
LUC Site Map